Ontario

Standing Committee on Resources Development

Report on Accidents and Fatalities in Ontario Mines

1st Session 34th Parliament
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STANDING COMMITTEE ON
RESOURCES DEVELOPMENT

Ontario

LEGISLATIVE ASSEMBLY
ASSEMBLÉE LÉGISLATIVE

COMITÉ PERMANENT DU
DÉVELOPPEMENT DES RESSOURCES

The Honourable Hugh Edighoffer, M.P.P.,
Speaker of the Legislative Assembly.

Sir,

Your Standing Committee on Resources Development has the honour to present its Report on Accidents and Fatalities in Ontario Mines and commends it to the House.

Floyd Laughren

Floyd Laughren, M.P.P.
Chairman

Queen's Park
July, 1988

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INTRODUCTION

Last year there were 19 accidental deaths in the mining industry, making 1987 the worst year for mining fatalities since 1980. The Throne Speech of November 3, 1987, referred to the need for greater protection for workers in the province and specifically asked the Standing Committee on Resources Development to assume the task of recommending ways of further reducing injuries and fatalities in Ontario mines. By a motion of the House on January 7, 1988, the Standing Committee on Resources Development was asked to:

"Consider and report on safety in Ontario mines including

1. the implementation of recommendations on mining safety put forward by past commissions of inquiry, including the Provincial Inquiry into Ground Control and Emergency Preparedness in Ontario Mines, 1986;

2. both provincially and nationally, the consultative mechanisms between labour, industry and Government that identify hazards and put in place mechanisms to reduce or eliminate the risk of death and injury in the workplace;

3. the underlying causes of mining accidents and report on the major contributing factors thereto;

4. and to advise on additional initiatives needed to improve engineering, education and enforcement activities to reduce the incidence of injuries and fatalities in mines and mining plants."

The Committee began 21 days of public hearings on January 20, 1988. They began at Queen's Park in Toronto and continued in the following mining communities: Hagersville, Goderich, Elliot Lake, Sudbury, Caledonia, Windsor, Timmins, Balmertown, Manitouwadge and Hemlo. The hearings were completed in Toronto on April 11, 1988. During this time, the Committee heard oral submissions and/or received written submissions from a number of witnesses including workers, representatives of union locals, mining companies, and interested professionals.

Members of the Committee wish to express their appreciation to all of the witnesses who appeared before the Committee. The Committee also wishes to express its appreciation to the Ontario Mining Association (OMA) and its member companies for coordinating the Committee's underground mine tours throughout the province.

The Committee wishes to thank staff and officials of the following ministries and agencies of the Ontario government for their able assistance and cooperation: Northern Development and Mines, Labour, and the Workers' Compensation Board.

The Committee also wishes to acknowledge the assistance and valuable support of staff: Todd Decker, Clerk of the Committee, Lynn Mellor, Clerk pro tem, and Lorraine Luski, Research Officer.

The Committee's mandate is significant in that it represents the first time that the Legislature, rather than an external commission of inquiry, has been asked to consider and report on safety in Ontario mines. One of the key tasks included in the Committee's mandate was to report on the status of recommendations of past commissions of inquiry. The Committee noted that since 1975 there have been a number of inquiries looking into various aspects of mining health and safety – i.e. the Royal Commission on Health and Safety of Workers in Mines, 1974 (Ham Commission); the Joint Federal–Provincial Commission of Inquiry into Safety in Ontario Mines, 1980 (Burkett Commission); and the Provincial Inquiry into Ground Control and Emergency Preparedness in Ontario Mines 1984 (Stevenson Inquiry). The Committee reviewed the past recommendations and considered the outstanding ones, which are addressed in Appendix A of this report.

In particular the Committee sought an explanation for the rising number of worker fatalities in light of a declining lost time injury rate. The rise in mine fatalities has been of such concern to the industry that a special ad hoc committee of management, labour and Ministry of Labour personnel was formed in June 1987 to review the problem.

Early during the course of public hearings, the Committee learned that an issue generating considerable debate among parties in the industry was the "internal responsibility system" (IRS) – a concept developed by Dr. James Ham and enhanced by Kevin Burkett. IRS places direct onus for safety in the workplace on management, supervisor, and worker and extends that responsibility to advisory bodies such as workplace health and safety committees, safety departments, unions, safety associations and the Ministry of Labour.

Mine management believes IRS is critical to the enhancement of safe production in the workplace. Labour suggested that to work properly, IRS must confer more authority upon workers. A full discussion of the Committee's views on the IRS can be found in Section III of this report.

Another issue that generated debate was the issue of traumatic injuries and fatalities versus occupational illness. The Committee's terms of reference were limited to traumatic accidents. However, several witnesses were disappointed to learn that all factors that could impair health or result in death or injury in the workplace, such as industrial diseases, were not included in the Committee's terms of reference. At the urging of several witnesses, the Committee agreed to address this concern in one of the recommendations.

I ACCIDENT CAUSES AND CONTRIBUTING FACTORS

Underground mining is an extremely hazardous occupation. The mine environment is harsh and unforgiving because of poor lighting, open holes, the presence of heavy equipment, the use of explosives, falls of loose rock from the ceilings or walls, and rockbursts – explosive failures of rock caused by high rock stress. These conditions increase the risk of injury or death.

An accident has been described as an unexpected, unpredictable event, resulting from a complex interaction of several factors: worker, object causing the injury and the circumstances surrounding the accident[1]. Accidents are generally found to have more than one major cause and may have several underlying causes. However, there is no consensus concerning whether accidents are caused by unsafe acts or conditions.

Experts in the field of injury prevention contend that 90% of accidents in general are caused by unsafe acts while 10% are caused by unsafe conditions[2]. According to the Mining Health and Safety Branch of the Ministry of Labour (MHSB), improper practices are responsible for about 60% of serious/fatal accidents while improper conditions account for about 40%.

On the other hand, the Workers' Compensation Board noted that hazardous conditions are the primary cause of workplace accidents. The Board took a sample of lost time accident claims for all provincial industries and the data revealed that the vast majority of the accidents were attributable to hazardous conditions (88.8%) as opposed to unsafe acts (11.2%)[3]. The WCB data also show that the biggest factor contributing to the hazardous conditions was defects of items/agents (e.g. broken items/tools, slippery material).

Those who point out that accidents are caused primarily by unsafe acts are quick to add, however, that these unsafe acts are not due to deliberate neglect, but to human imperfections. They also emphasize that determining the causitive factors is not to allocate blame but to recommend corrective action to prevent similar accidents. The MHSB agrees, noting in their submission, that attributing accidents to improper practices does not imply that the individual miner was at fault in these accidents.

> The miner is one link in the chain of responsibility for safety, and accidents attributed to improper practices may well have their origin elsewhere – in inadequate training or supervision, for example[4].

The MHSB has developed a form which is completed by Ministry inspectors and is used in serious/fatal accident investigations in Ontario mines. The information is numerically coded and entered into an accident database so that the causes and contributory factors can be analyzed. The top 10 major causes of accidents attributable to improper practices, according to the MHSB, in order of greatest to least frequency are as follows: failure to observe (16%); improper position (14%); failure to warn, secure (14%); failure to use safety device (13%); other (8%); improper/inadequate equipment (6%); failure to use protective equipment (5%); failure to communicate (5%); servicing equipment in motion (4%); improper use of equipment (4%).

The MHSB includes the following personal factors as contributing to improper practices: lack of safe job procedure (25%); other (24%); self–urgency (15%); lack of safety training (7%); lack of knowledge/skill (7%); lack of proper job training (6%); risk taking personality (6%); abuse of equipment (4%); pressure from supervision (1%).

The MHSB notes that the major causes of serious/fatal accidents attributed to unsafe conditions are as follows: guards/protection (29%); other (19%); tools/equipment/substances (18%); workplace layout (12%); hazardous atmosphere (6%); fire/explosion hazards (4%); warning system (3%); congestion (3%); housekeeping (3%); illumination (1%); ventilation (1%).

According to the MHSB, the majority (62%) of fatal accidents occurred underground. The leading causes of fatalities in the mining industry between 1974 and 1987 in order of greatest to least frequency were as follows: mobile vehicle (24%); falls of ground (22%); fall of person (17%); fall of material (13%); machinery (11%); all other causes (14%)[5].

II MINING ACCIDENTS AND FATALITIES: TRENDS

The Committee endeavoured to learn about the significance of the mining accidents and fatalities in Ontario by reviewing accident trends for mining and other industries in the province. Statistics on mining accidents are maintained by three bodies – the Ministry of Labour's Mining Health and Safety Branch (MHSB); the Mines Accident Prevention Association (MAPAO); and the Workers' Compensation Board (WCB).

The accident data bases differ for all three. Whereas accident statistics for mining operations regulated by the MHSB include: underground mines, open pit mines, diamond drilling, metallurgical plants, metallurgical labs, sand and gravel, quarries and others, accident statistics collected by the Mines Accident Prevention Association (MAPAO), include: gold mines, nickel mines, uranium mines, iron mines, mixed mines, diamond drillers and contractors.

The WCB also collects accidents/injury statistics for the MAPAO via the Employer's Report of Accidental Injury or Industrial Disease (Form 7). Unlike the MAPAO, which collects statistics on traumatic accidents only, the Board collects accident data on both traumatic injuries and industrial diseases. There is a statutory requirement for "medical aid" claims, "lost time injury" claims and fatalities to be reported to the Board. Medical aid claims are also known as "health care only" or "no lost time" claims. They are usually associated with minor injuries requiring less than one day's absence from work. Lost time injuries are compensable injuries which result in a period of time away from work. These claims may involve costs charged against an employer in terms of increased assessments per $100 of payroll. There is no statutory requirement for an employer to report "first aid" injuries to the Board, but Regulation 950 under the Workers' Compensation Act requires the employer to keep a record of the accident.

Accident statistics maintained by these three agencies are usually expressed as a frequency per 1,000,000 or 200,000 person hours worked to provide a common basis of comparison from year to year or from mine to mine.

Lost Time Injuries

According to a submission from representatives of the WCB who appeared before the Committee, lost time accidents/claims have declined in the mining industry over the past six years. In terms of the absolute numbers, there were 3,221 claims in 1982, down to 2,557 in 1987.

The injury frequency rate (IFR), which is based on the number of lost time accidents per 100 mining employees in Ontario, has also decreased over the last six years although there was a slight increase in 1987. The Board's representatives reported that in 1982, the MAPAO recorded 7.99 lost time accidents per 100 workers. By 1987, this had dropped to 6.38 accidents per 100 employees, a decrease of 20.2%. In terms of the injury frequency rate, at 6.38, mining compares favourably with other industries, ranking fourth best among nine industry associations – Mining ranks behind Ontario Pulp and Paper Makers Safety Association (OPPMSA) (3.42), Health Care Occupational Health and Safety Association (HCOHSA) (3.91), and Electrical Utilities Safety Association (EUSAO) (5.89). However mining ranks ahead of Industrial Accident Prevention Association (IAPA) (7.02), Farming Safety Association (FSA) (8.84), Construction Safety Association (CSAO) (10.31), Transportation Safety Association of Ontario (TSAO) (12.60), and Forest Products Accident Prevention Association (FPAPA) (12.68).[6]

In terms of accident severity, or average duration on compensation, the mining industry has the highest severity rate of any industry in the province. According to provisional figures supplied by the Board, the average duration on compensation for lost time accidents in the mining industry was 17.7 weeks. Next in terms of severity was the OPPMSA at 13.6. FPAPA rated 11.6; CSAO 11.2; FSA 7.7; TSAO 7; IAPA 6.3; EUSAO 5.9; and HCOHSA 5.8. Board representatives noted that the trend of increasing severity is not unique to mining but is noticeable in all industries in all provinces.

The Committee obtained an overview of the compensable accident experience within the mining industry by considering the following WCB assessment levies per $100 of payroll for each of the seven mining rate groups.[7] Similar to insurance premiums, they are ranked from least to most expensive assessment per $100 of payroll according to the accident experience or risk faced by employees in the rate group.

1988		$
091	Mixed Mines	4.88
095	Iron Mines	5.59
076	Nickel Mines	9.84
084	Uranium Mines	9.85
069	Gold Mines	10.45
098	Diamond Drillers	13.11
106	Contractors	29.22

Medical Aid Accidents

The Committee noted that attention regarding the injury situation in Ontario mines was focussed primarily on lost time injuries – compensable injuries that result in time off work. Data on medical aid accidents, deemed a "less serious variety of accident" by the MAPAO, were gathered for the first time by the safety association only three years ago. According to the Ontario Mining Association's presentation to the Committee, "the mining industry, through the MAPAO has kept careful track of accidents reported to the WCB since 1932, and has chosen to focus on traumatic lost time accidents for the purposes of comparison."[8]

Few presentations to the Committee during the course of public hearings drew attention to the accident rate for medical aid claims versus the lost time injury rate. Falconbridge's submission provided a graph which showed medical aid frequencies (per 200,000 hours worked) for 26 mining companies. In 1987 the industry average for medical aid accidents was five times greater than it was for lost time accidents. For lost time injuries the industry average was just under 4 (per 200,000 hours worked), while the industry average for medical aids was around 20.

In view of MAPAO's limited statistics on medical aid accidents, the Committee asked the WCB to prepare a table on the ratio of health care only/no lost time claims and lost time claims for the mining industry. The results are as follows:

RATIO OF HEALTH CARE ONLY CLAIMS (NO LOST-TIME CLAIMS) TO COMP. CLAIMS

MINING INDUSTRY VS. TOTAL PROVINCE 1982-1987

	Mines Accident Prevention Association			Total Province		
Year	Health Care Only Claims	Comp. Claims	Ratio HC/C	Health Care Only Claims	Comp. Claims	Ratio HC/C
1987	4,379	2,557	1.71	221,729	209,255	1.06
1986	4,378	2,470	1.77	210,375	203,241	1.04
1985	4,526	2,562	1.76	207,104	188,461	1.10
1984	4,866	3,024	1.61	192,919	172,002	1.12
1983	4,217	2,787	1.51	175,871	147,666	1.19
1982	4,458	3,221	1.38	183,990	148,713	1.24

Note: Health Care Only Claims are allowed no lost-time claims by year of set-up. Source is WCB Statistics System S57.

Compensation Claims are allowed lost-time claims based on year of first comp. payment. Source is WCB Statistics System S57.

Ratio HC/C is the ratio of health care only claims to compensation claims.

The foregoing table, which details the ratio of health care only/no lost time claims to lost time claims and compares it to all industries in the province, clearly shows that the mining industry has a higher proportion of medical aid/no lost time claims to lost time claims relative to the rest of the province. Moreover, this pattern has been increasing in mining and declining in other industries over the last six years. In view of this pattern, unique to mining, and the fact that there are almost twice as many medical aid injury claims relative to lost time claims, the Committee believes that these accidents deserve the industry's particular attention.

Despite the industry's preoccupation with lost time injuries, the Committee noted, however, that several mining companies emphasized in their submissions the need to monitor injuries of all types – first aid, medical aid and compensable. Falconbridge's submission noted that the best indicator of safety performance is the frequency of all accidents where health care is required.

Fatalities

According to the following table prepared by the WCB, there has been a steady and noticeable rise in traumatic injury deaths in mining since 1982. Illness fatalities have outnumbered injury fatalities in most years except 1987.

ALLOWED INDUSTRIAL FATALS IN THE

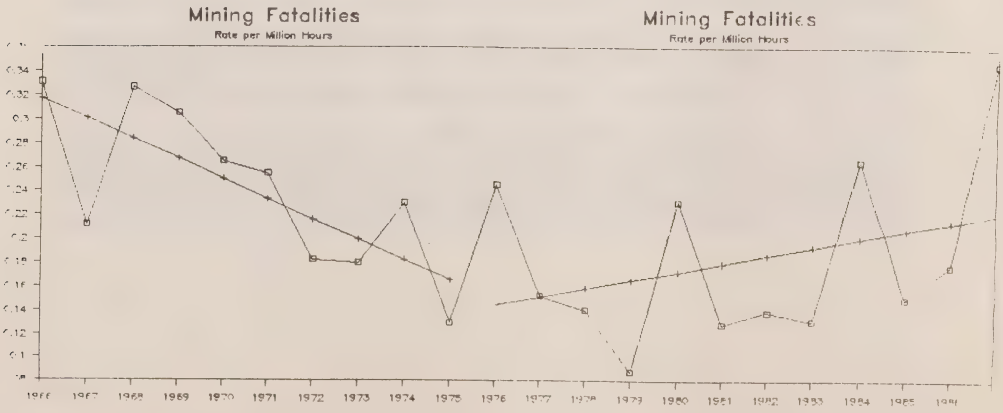
MINES ACCIDENT PREVENTION ASSOCIATION OF ONTARIO 1982-1987

Year	Injury Fatals	Illness Fatals	Total	% Change Year-to-Year
1987*	19*	19*	38*	+ 8.6%
1986	13	22	35	+12.9
1985	9	22	31	-22.5
1984	16	24	40	+60.0
1983	9	16	25	-16.5
1982	9	25	34	-
% Change '82-'83				+11.8%

*1987 information is provisional.
It can only be finalized at a later time.

Compared to other industries in the province, the fatality rate in mining is high. In 1985 mining had a fatality rate of .19 per million man hours. At .32, only forestry was worse. By comparison, the fatality rate was only .02 in manufacturing and .09 in construction.[9]

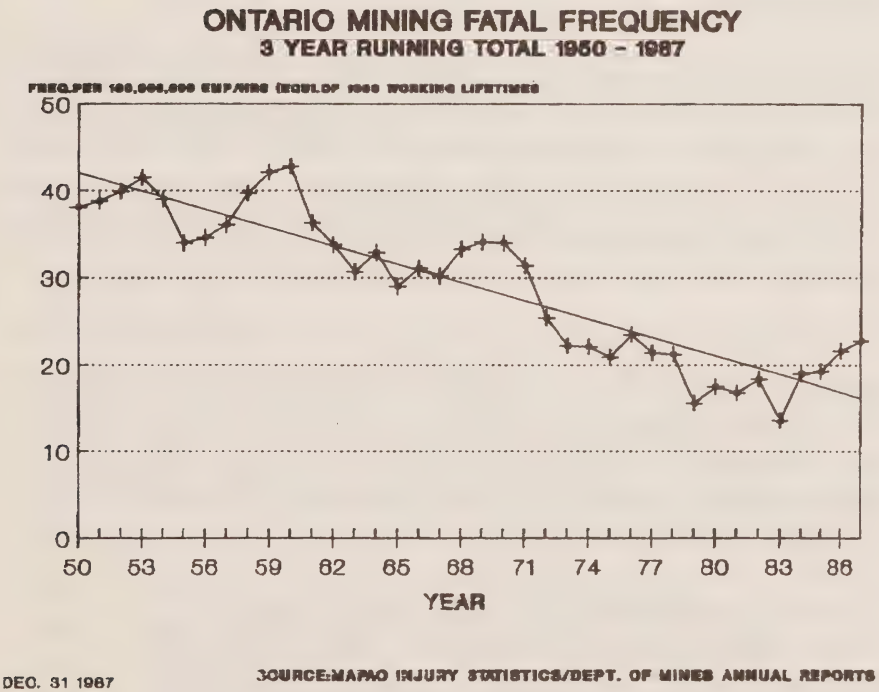
Looking at the fatality frequency rate within the mining industry over the past two decades, one would observe random fluctuations from year to year.



Source: MAPAO 1987

The Ministry of Labour's Mining Health and Safety Branch (MHSB) added this cautionary note in their submission regarding interpretation of fatality trends:

> Fortunately the number of fatal accidents is relatively small; they are relatively rare occurrences. Because the number of fatal accidents is small in comparison with all lost time accidents, a very small change in the number of deaths – perhaps the result of a single accident – can result in a distorted perception of accident trends. For this reason it is often necessary to consider fatal accidents over a longer period of time, and to use averaging techniques that smooth out the unusual occurrences before trends are clearly visible.[10]



"Iceberg" Theory of Accidents

A number of presentations made to the Committee referred to the "Iceberg" Theory of Accidents. Also known as the Accident Ratio Study or Accident Triangle, this theory holds that fatalities are the tip of the iceberg. Under the surface are accidents requiring time off work to recover and accidents requiring medical aid and first aid. Below those are accidents involving property damage and further below are accidents of an even lesser severity. A probability ratio has been developed which states that for every 600 reported incidents, 30 will result in property damage, 10 in minor injuries and 1 in a major injury. In mining, it is thought that if a mine experiences enough medical aid accidents, lost time accidents will rise, and sooner or later there will be a fatality.

It was therefore inevitable that when the rising fatality rate showed no correlation to the falling lost time injury rate, the iceberg theory would be called into question. During the Committee's visits to various mines around the province, Members asked witnesses how they would account for the perplexing phenomenon of a rising fatality rate in light of a falling lost time injury rate.

Several workers and at least one mine manager noted that the more serious injuries are being masked by the proliferation and sophistication of light duty and modified work programs. According to one witness, serious injuries are now being reported as medical aid injuries instead of lost time. Hence, it appears as though the frequency of these serious accidents is declining when they are really being masked as medical aids.

The Committee wondered if there is any objective way of measuring whether there is a heavy usage of modified work or light duty in the mining industry. According to the WCB, there is currently no requirement for mining companies to notify the WCB of light duty work. However, light duty can be measured indirectly if one assumes that many of these cases are being sent to the WCB as health care only/no lost time claims, and by examining the pattern of no lost time claims relative to lost time claims in mining. We have noted earlier in the report that there are almost twice as many no lost time claims as lost time claims, the ratio being 1.71 to 1.

The increase of no lost time relative to lost time accidents in mining appears somewhat artificial on the face of it, especially when one considers the inherently, risky nature of mining and the expectation that when an accident occurs in mining the consequences will be more serious than in industry at large. At least one mining industry representative has openly discussed this new accident reporting strategy in industry journals:

> Historically, Falconbridge measured its safety record by the frequency of medical aid injuries. By that yardstick, the accident rate looked pretty good says Bob Brailey, manager of human resources and public affairs. At the same time the frequency of lost time accidents was one of the highest in the industry. So the focus of the safety strategy was shifted, and steps were taken to cut the number of compensable injuries.[11]

If what was traditionally reported by the company as a lost-time injury is now being reported to the WCB as a medical aid, what is the motivation behind this change in statistical reporting?

The Committee sought an explanation from the WCB. According to the Board, the main incentive for mining companies is economic in that there will be minimal cost to the company if a "no lost time" claim rather than a "lost time" claim is filed.

This financial benefit, however, is diminished by the fact that the company will have to absorb the cost by continuing to pay the injured individual full wages while on light duty.[12] A representative of the Canadian Diamond Drillers Association, who appeared before the Committee on March 8th, had this to say:

> . . as a matter of fact, we are telling the contractors now that it is better to absorb the cost. You have to report it anyway, but do not go for the compensation. They are doing that now, by the way . . .[13]

This practice offsets increased accident costs charged to the company by the WCB and precludes increased assessment levies on that firm.[14] The Ontario Mining Association expressed in their presentation to the Committee that an increase in the industry's compensation costs, despite a 36% reduction in compensation claims between 1980 – 1986, has caused the industry great concern. However, the OMA does acknowledge that the high persistency rate of injured workers in mining may be contributing to rising compensation costs.

A second reason for placing a worker on light duty may be that the policy is encouraging a worker to maintain regular work habits such as getting up each morning, spending eight hours at work each day, and so on. Mining companies are apprehensive that once an employee is off work and at home, it could be difficult to motivate the worker to return to work. Moreover, the company benefits from some light work/production from the worker such as painting, etc. Some companies are supplementing their modified work programs with physiotherapy and exercise classes for employees.

A third possible reason for cutting the number of compensable claims and reporting an injury as "no lost time" is that a company can avoid the stigma of a rising lost time injury rate, which suggests lack of progress in safety matters.

The Committee, having carefully considered this issue, believes that the mining companies, in an attempt to reduce the number of lost time accidents (and therefore lower their WCB assessment rates), are now reporting injuries of greater severity as "health care only" (no lost time) claims instead of "lost time" claims. The Committee further believes that it is this shift in recording accidents which has resulted in the declining lost time injury rate.

Standard Definition of Accident

The Committee's concern surrounding this shift in reporting is two-fold. Not only is the declining lost time injury rate masking the true situation concerning serious injuries, and causing the industry and the public to wonder about the rising number of fatalities, but a "declining" lost time injury rate could also distort the response of the industry in terms of setting priorities and establishing appropriate safety strategies.

This problem of shifting accident reporting could have been avoided if consistent criteria or definitions had been established delimiting medical aid and compensable accidents. The Burkett Report noted "that a primary requirement of an accident data base is to provide clear and unambiguous definitions of what accidents are to be included in the statistics produced. This includes the need to define an accident, the minimum severity of the accident, the occupational categories covered and the time frame involved."[15]

Without such a standardized definition of an accident, serious injuries traditionally reported as lost time could be masked as medical aids, which will have the unintentional effect of distorting the accident statistics, particularly the more serious ones.

The Committee therefore believes that in order for the industry to get a truer picture of their accident trends, the industry must establish a standardized definition of an accident – both lost time and no lost time. It should be noted that this recommendation parallels one made by the OMA.

The Committee believes that minimum levels of severity should be established before recording accidents as medical aid or lost time. For example, should the industry characterize a worker with a broken arm and leg as a lost time injury, or, if the injured person returns to work can he/she immediately be classified as medical aid and placed on light duty?

Without standardized definitions of such accidents some companies will record an accident of a given severity as a lost time accident while others will record it as a medical aid. Such inconsistencies in reporting accidents distort the statistics and render them meaningless.

Recommendation:

1.1

A working group comprised of representatives from the mining safety association, the MHSB, the WCB and organized labour should be formed in order to establish a standard definition of an accident. The working group should also establish standardized criteria to assist mine personnel to determine how accidents of a certain level of severity should be reported.

Accident Database

The Committee reviewed Burkett's recommendation concerning an accident data base for the mining industry. Burkett stipulated that the data base should include a requirement for reporting current data in aggregate form concerning the number of workers within defined sub groups (age, service, occupation, shift, etc.). This information is required to determine "population at risk" groups.

A representative of the MAPAO provided the Standing Committee with a paper entitled "Accident Investigation in the Ontario Mining Industry" which had been presented to the Annual General Meeting of the Canadian Institute of Mining in 1984. While the paper provides a detailed description of the development of the industry's accident investigation form, "form X", the paper also echoes Burkett's recommendation concerning the need to develop "population at risk" data.[16] The paper suggests that this information could be provided to the safety association by mining companies on an annual or biennial basis. According to the authors, the major shortcoming of the current data base is that "we now know that many miners between the ages of 26 and 30 are being injured on the job, but we do not know what percentage of the total workforce is in this age bracket."[17]

The Committee notes that there have been at least three commissions of inquiry into mining safety since 1975. Each time an inquiry is formed, it becomes necessary to update accident statistics. This can be an onerous task if mining companies do not maintain data in a form where the demographic characteristics of employees experiencing accidents can be measured against the demographic structure of the workforce as a whole. If a data base was set up to retrieve this type of information, it could provide the industry and its safety association with an enhanced awareness concerning the population of greatest risk within the workforce. The industry could then target its safety programs to these "high risk" groups.

This information would also help mining companies to evaluate the longer term effectiveness of current safety programs such as the "Common Core" which is geared specifically toward the new, inexperienced miner.

Recommendation:

2.1 In order to develop "population at risk" data, the mining safety association should require mining companies to provide, via their personnel records, aggregate information on an annual or biennial basis concerning the number of workers within defined subgroups (e.g. age, years of service, shift).

III INTERNAL RESPONSIBILITY SYSTEM

A key factor in reducing accidents and injuries in mining is consultation between the parties. The best example of that is the tripartite committee structure. Perhaps even more fundamental to the concept of workplace safety is the IRS.

While the Occupational Health and Safety Act does not specifically use the term "Internal Responsibility System", the IRS is the centrepiece of the Act. It describes the rights and responsibilities of workers and employers and specifies what they must do in order to comply with the Act and Regulations. As noted earlier, IRS places direct responsibility for workplace safety on management, supervisor and worker, and assigns contributory responsibility to advisory bodies such as: health and safety committees, safety departments, Ministry of Labour inspectors and the like.

The Committee notes that mine management perceives the IRS as improving workplace safety. Management suggested that the only alternative to the IRS is the "policeman" model, whereby legislation describes in great detail how safety standards are to be met. An army of inspectors is then mandated to inspect the workplace for possible violations and infractions which are responded to with citations and penalties.[18]

When the Committee began public hearings, there was consensus among all the parties that the IRS was not operating as effectively as it could. Not all workers or their supervisory personnel fully understood the concept. A Committee member spoke to one miner who had never heard of the IRS, and of those who did, a number of workers expressed several concerns about it.

After careful consideration, the Committee has concluded that it favours the principles of IRS. A key strength of IRS is the onus it places on all workplace parties to correct substandard conditions once they have been identified. The Committee is aware, however, that a large gap may exist between the theoretical understanding and the practical application of internal responsibility. Throughout this report, the Committee has made several recommendations designed to address the system's shortcomings.

The Committee wishes to emphasize that the IRS must not be viewed by the parties as a "stand alone" initiative. To work properly it must be supported by other initiatives such as appropriate enforcement of legislation and regulations by government, and strong support by the CEO in terms of ensuring accountability of mine management. Finally, workers and their safety representatives must be well trained about their workplace responsibilities and knowledgeable about the Act and regulations.

The Committee views the IRS as an opportunity to address workplace health and safety issues in a self regulatory manner. The Committee hopes that the parties continue their efforts at making the system work. Failure to make IRS work properly, coupled with continuing high fatality rates, may prompt the government to look more favourably upon alternatives to IRS.

IV MECHANISMS OF CONSULTATION

Provincial Tripartite Committees

The Standing Committee considered the usefulness of the tripartite committee mechanism, prevalent in the mining industry, in reducing accidents and fatalities. Tripartite committees are composed of representatives of labour, management and government. The Mining Health and Safety Branch (MHSB) notes that tripartite committee structures are used heavily in the mining industry because safety requires the cooperation, support and participation of all three parties involved in the mining process. The five major tripartite committees operating in the Ontario Mining Industry described by the MHSB in their submission are as follows: the Mining Legislative Review Committee, the Committee on Mining Training, The Committee on Mining Fatalities, the Mine Rescue Advisory Committee, and the Labour–Management Committee on Hazardous Substances.

Mining Legislative Review Committee (MLRC)

The MLRC was formed in 1975 to review the Mining Act and to draft regulations pertaining to health and safety in mines and mining plants. The purpose of the Committee is to provide the Minister with advice and counsel on an on–going basis from a cross–section of the mining community in Ontario with respect to legislation and regulations relating to occupational health and safety in mines. The Committee is composed of nine members: four from labour, four from mine management and a neutral chairperson. The Committee meets approximately four times a year to review and discuss the following:

- suggestions for changes to the mining regulations;
- recommendations from coroners' juries concerning possible changes to mining regulations;
- specific areas of mine safety reviewed by sub–committees of the MLRC.

Committee on Mining Training (CMT)

The Committee on Mining Training (CMT) is an advisory committee appointed under the authority of Section 11 of the Occupational Health and Safety Act. It is comprised of 6 representatives of labour, 6 representatives from management and is chaired by an individual from the Ministry of Skills Development. Some of the initiatives of this committee are as follows:

- developed an industry-wide basic/supplementary training for underground hard rock and soft rock miners (The Common Core for Basic Underground Hard Rock/Soft Rock Mining Skills; and Specialty Modules Underground Hard Rock/Soft Rock Mining);
- established a similar training program for First-Line Underground Supervisors;
- is in the process of developing a ground control module for non-miner underground professionals;
- is currently considering training/programs in literacy, a common core for service personnel and a number of specialty skills in addition to the 37 modules now existing.[19]

Mining Fatalities Committee

The Mining Fatalities Committee was formed spontaneously in the summer of 1987 in response to a significant increase in the incidence of fatal accidents. Comprised of representatives from the MAPAO, mine management, labour, and the MHSB, the Committee meets on an ad hoc basis to pursue four initiatives:

- investigation of the "fail safe" system and its possible application to mining equipment, mine design and production procedures; Fail safe identifies/assesses potential hazards and either engineers them out, or minimizes potential for failure;[20]
- consideration of the IRS with a view to "making it work" by developing a training module;
- a review of accident and fatality statistics to uncover possible links between accidents and factors that have previously gone unrecognized. The tripartite Committee is also interested in developing a standardized database which will permit more accurate comparisons, and will suggest priorities for accident prevention programs;

- an investigation of the role played by attitudes in safety matters. A researcher is undertaking a survey to determine how mine personnel can be encouraged to pay greater attention to safety. This research involves workers and management at the Dome Mine in Timmins.

Advisory Council on Occupational Health and Safety (ACOHOS)

This multi-partite council is comprised of management, labour, technical/professional persons and the public. The council provides advice to the Minister of Labour on occupational health and safety matters. One of the subjects reviewed in 1986-87 concerned the establishment and functioning of joint health and safety committees.

Mine Rescue Advisory Committee

This committee was set up in 1987 in response to the recommendations of the Stevenson Inquiry, which urged Mine Rescue to expand its capabilities to handle non-fire emergencies. The committee is tripartite in nature and meets twice a year. It is currently pursuing the following initiatives:

- development of a crisis management resource manual to assist mine management in developing an emergency preparedness program;
- collection of information/materials pertaining to mine rescue techniques used in other jurisdictions;
- recommending purchase of equipment required for non-fire emergencies.

Labour-Management Committee on Hazardous Substances

This tripartite committee was formed by the Minister of Labour in 1987 with a mandate to review how hazardous substances are regulated in Ontario in mines and all industrial applications. The committee is chaired by the Ministry of Labour's Assistant Deputy Minister, Occupational Health and Safety Division, with representation from various industrial sectors and labour groups. In light of the proliferation of regulations concerned with health issues, designated substances, and legislation such as Workplace Hazardous Material Information System (WHMIS) which gives workers "the right to know" what substances are used in the workplace, this committee is examining the entire question of regulation of hazardous materials.

Mining Research Directorate (MRD)

The Mining Research Directorate was formed in the wake of the Stevenson Inquiry, which recommended the establishment of a research body to coordinate mining research in Ontario with a focus on ground control and rock mechanics in underground hardrock mines. As a result the OMA formed a Research Directorate to identify research needs, locate sources of funding and to coordinate research efforts.

The directorate is located on the Laurentian University campus in Sudbury, and its Board of Directors is comprised of representatives of labour, industry and government. A sampling of several projects includes the following:

- development of catalogue of software applicable to rock mechanics problems;
- stope (mine excavation) redevelopment through stabilized backfill;
- state of the art review of geophysics applicable to underground hardrock mining;
- improved methods for monitoring backfill;
- rockburst support protection.

National Consultative Mechanism

Canada Centre for Mineral and Energy Technology (CANMET)

The mandate of CANMET is to enhance the role and contribution of minerals and energy to the Canadian economy by means of mission oriented research and development in mining, mineral processing and utilization of metals, industrial minerals and fuels. The Standing Committee on Resources Development toured CANMET's Elliot Lake laboratory and became acquainted with several important areas of mining-related research. A sampling of such projects include:

- rockburst research – the effects of geological structures, gravitational forces and mine layout on rockbursts. In September 1985 a five year rockburst project was initiated at a cost of $4.2 million. It received tripartite funding from the federal and provincial governments and the Ontario mining industry. The objectives of the Canada-Ontario

Rockburst Project are to develop new seismic monitoring systems; to investigate causes and mechanisms of rockbursts; and to evaluate strategic and tactical methods of alleviating rockbursts;

- underground environmental studies in radiation, ventilation and respirable dust;
- research into radiation instrumentation calibration;
- reactive acid tailings research program.[21]

V PREVIOUS COMMISSIONS OF INQUIRY

There have been a number of major inquiries into mining health and safety in Ontario since 1974. The Committee considered the findings of three, the Royal Commission on Health and Safety of Workers in Mines (Ham Commission); the Joint Federal Provincial Commission of Inquiry into Safety in Ontario Mines (The Burkett Commission); and the Provincial Inquiry into Ground Control and Emergency Preparedness in Ontario Mines (Stevenson Inquiry).

These inquiries were set up in response to rising trends in accidents or fatalities. A perception held by many witnesses appearing before the Committee was that a number of recommendations have not been followed up. A key task of the Resources Development Committee was to clarify the status of implementation of these recommendations from past commissions of inquiry. The specific commissions of inquiry in chronological order are as follows:

- **The Ham Commission:** The Commission was established in September 1974 in response to growing public concern about the health and safety of workers in mines. The Commission's broad mandate included an investigation of all matters related to health and safety in Ontario mines. The Commission submitted its report in June 1976. It included 116 recommendations.

- **The Burkett Commission:** The Commission was established in July 1980 in response to a rise in worker fatalities in Ontario mines in the first half of 1980. The Commission was instructed to inquire into and report on the adequacy of existing arrangements and practices affecting safety in Ontario mines. The Commission's report was submitted in April 1981. It included 82 recommendations.

- **The Stevenson Inquiry:** The Committee was established in October 1984 in response to the June 1984 rockburst at Falconbridge which claimed four lives. The Committee was instructed to investigate ground control and emergency preparedness issues and review incidents of ground falls and rockbursts in Ontario. The Committee's report was submitted to the Minister of Labour in February 1986. It included 60 recommendations.

The Ministry of Labour's MHSB provided the Committee with a detailed list of all recommendations from past commissions of inquiry and a summary of the actions taken. The Committee reviewed all the recommendations[22] and observed that most have been addressed. The 17 outstanding recommendations identified by the Committee concern controversial issues about which the parties could not agree. Among the key recommendations not yet implemented are:

- statutory provision for Worker Safety Representatives;
- joint training of health and safety committees;
- reward/penalty provision re: mining contractors;
- development of cost indicator models;
- the inclusion of labour/public representatives on MAPAO's board of directors;
- study on the extent of drugs/alcohol in the mining industry;
- discontinuance of the individual (or small crew) production bonus.

The complete list of all past recommendations, including the Committee's response to those outstanding, has been appended to this report (Appendix A).

So far this report has considered a number of areas pertinent to the study of mining safety: causes of accidents, contributing factors, accident trends and the tripartite mechanisms of consultation designed to enhance workplace safety. The Committee has also considered the recommendations of past Commissions of Inquiry and identified recommendations not yet implemented. Having completed this review, the Committee turned its attention to formulating its own recommendations designed to reduce the incidence of injuries and fatalities in mines and mining plants. These additional initiatives are the subject of the next section.

VI NEW INITIATIVES REQUIRED

Chief Executive Officer (CEO)

The Committee recognizes that the CEO has considerable influence over the safety performance of the company. In the course of public hearings the Committee noted that a number of CEOs of mining companies demonstrate their commitment to safety in the company by personally signing a written policy statement declaring that management will give first consideration to matters of safety and health in the workplace. While the Committee applauds the initiative, it believes that the CEO could take his/her commitment to safety a step further by personally reviewing reports of each accident and fatality.

The Committee also believes that the CEO should assume responsibility for ensuring that new mines, work processes and equipment are designed according to the "fail safe" method of identifying, assessing and "engineering out" potential hazards or minimizing their potential for failure. Hazards evident in existing mines should be modified accordingly.

Recommendations:

3.1 The CEO of each mining company in Ontario should demonstrate accountability for the safe performance of the organization by personally reviewing reports of each accident and fatality, and, once annually affirm in writing that this review has been conducted. Copies of this statement should be made available to the Joint Health and Safety Committee(s) of the Company.

3.2 The CEO should assume responsibility for the "fail safe" concept in mine design, mining equipment and production procedures.

A matter of concern to the Committee that arose during the course of public hearings was a situation where two long-time workers off work and recovering from injury, received letters from mine management warning that, due to absences not within their control, their continued employment was nevertheless at risk unless attendance improved because the absences were having an adverse effect on operations. The Committee learned from the workers that they were on workers' compensation and that there was no modified work available to them.

The Committee's interest in the issue centres upon how receipt of those warning letters could compromise safety. One of the workers reported that after receiving the letter he neglected to report a subsequent accident out of fear of possible termination. Later, when he caught flu and was put on medication, he went into work anyway despite his doctors advice to stay at home because his driving ability would be impaired. The workers reported feeling intimidated by the letters and suggested that the incidents impaired their concentration at work.

The Committee recognizes that "innocent absenteeism", whereby employees are absent for legitimate medical reasons, is not unique to the mining industry but affects the productivity of other industries as well. However, the Committee believes that these workers could be assisted rather than fired. Over the long term, mining as well as the rest of Ontario industry is going to have to tackle this problem with the cooperation of their workers. However, in the short term, the Committee believes that mine management should work with their employees to address the problem of "innocent absenteeism" in order to alleviate the non–reporting of accidents and the situations that could compromise safety. It is widely acknowledged that at the root of absenteeism are an array of causes: illness, boredom, stress, and personal problems. A number of these problems could be addressed through Employee Assistance Programs (EAP) which assist employees with personal problems on a confidential basis.

Recommendations:

3.3 **The CEO should ensure that mine management works with employees and unions to address the problem of "innocent absenteeism" through better use of existing counselling programs such as EAP, or, the promotion of a more challenging, positive working environment.**

3.4 **The CEO should ensure that he/she is kept informed of the company's strategies to address the problem of innocent absenteeism.**

3.5 **The CEO should ensure that where written communication to workers concerning chronic absenteeism is required as a last resort, these concerns should be communicated in a more sensitive manner.**

First Line Supervisor

The Committee heard from a number of workers that the position of first-line supervisor is critically important to safe production in the underground mine environment. In light of this, it concerned Committee members to learn from witnesses that first-line supervisors are not always sufficiently aware of the provisions of the Occupational Health and Safety Act and Regulations.

Recommendation:

4.1 **To ensure that First Line Supervisors function as part of the IRS, Supervisors should be required to obtain more comprehensive training in the Occupational Health and Safety Act and Regulations along with regular refresher training.**

Worker

A clear message heard by the Committee during the course of public hearings was that miners are eager for training in the Act and Regulations. Workers would like to receive an orientation to the Occupational Health and Safety Act so that they could exercise their rights and responsibilities under the Act. The Committee heard that few workers exercise their right to refuse work they believe is unsafe because they are unsure of their rights, and don't know what the system expects of them or what they can expect of the system. Workers noted that until they are sure of their rights and responsibilities under the legislation, they will be unable to function effectively as part of the IRS.

The Committee was pleased to learn that a number of mines in Northwestern Ontario are sponsoring workers to attend a 30 hour course on Occupational Health and Safety (Level I and II) through nearby Confederation College. The Committee believes that similar initiatives should be encouraged throughout the industry.

Recommendations:

5.1 **To understand their rights and responsibilities under the legislation and to function properly as members of the IRS, workers should receive more comprehensive training in the Act and Regulations within the first year of employment under the umbrella of Common Core training and receive regular refresher courses.**

5.2 The Guide to the Occupational Health and Safety Act should be more widely distributed among workers in the mining industry.

Workplace Joint Health and Safety Committees

A consultative mechanism in the mining industry that was of considerable interest to the Committee is the Joint Health and Safety Committee. The Occupational Health and Safety Act mandates the formation of Joint Health and Safety Committees in all workplaces which regularly employ more than 20 workers. According to the OMA, each mining company in Ontario has joint health and safety committees.

Joint health and safety committees are made up of representatives of management and labour. The committee's role is to identify hazardous conditions; make recommendations to management concerning improvements; and to recommend the establishment of programs and procedures respecting worker health and safety. The committee is also charged with the responsibility of obtaining information from management concerning the identification of hazardous materials, processes and equipment; and with obtaining information respecting health/safety experience, work practices or standards in other industries.

During discussions with workers and mine management during the underground tours and public hearings, the Committee heard that joint health and safety committees had not yet reached their full potential as bodies charged with a key role in safe production. Members of health and safety committees of mines and mining plants generally spoke of the need for more training in the legislation, such as the complex regulation pertaining to designated substances. They felt that health and safety committees would be more effective if members were better trained in the legislation, in how to conduct a proper workplace inspection and accident investigations.

Joint training is thought to ensure that committee members are taught a consistent view of the Act and Regulations. The Committee agrees and views joint training as a positive step noting that the two parties would be learning together.

It is the Committee's view that joint training should be the responsibility of the safety delivery agency of the mining industry. Workshops and training sessions could either be provided directly by the mining safety association, or, they could purchase the services of other organizations such as the Workers' Occupational Health and Safety Centre or any other organization with expertise in this area. Once trained, health and safety committee members should, in turn, train new miners undergoing the Common Core in basic health and safety legislation to ensure that workers understand their responsibilities and rights under the legislation.

Joint Health and Safety Committee

Recommendations:

6.1 **Members of Joint Health and Safety Committees should be required to participate in joint training designed to expand health and safety committees' awareness of the Act and Regulations and to enhance understanding of the roles and responsibilities of committee members. The provision of joint training in health and safety should be the responsibility of the mining safety association.**

6.2 **Once properly trained in the Act and Regulations, members of the Joint Health and Safety Committees should in turn be permitted to teach workers undergoing Basic Common Core Training for the purpose of familiarizing workers with the Act and Regulations.**

Another concern brought to the attention of Committee Members by health and safety representatives was that health and safety committees sometimes deal with matters repeatedly at meetings because corrective action is not taken.

The Committee regrets to learn that items brought to the attention of mine management by health and safety committees sometimes languish on the agenda for several months or longer without proper attention. It is the Committee's view that such unresponsiveness could breed cynicism toward the joint health and safety committee system and erode the IRS.

It is critical, therefore, that mine management promote the concept of IRS by correcting substandard conditions in mines and mining plants once they have been reported by health and safety committees.

Recommendation:

6.3 **Mine management should be required to provide written responses to all recommendations of the Joint Health and Safety Committees, particularly when a Committee recommendation is rejected by mine management. Copies of all Joint Health and Safety recommendations and their responses should be audited by MHSB inspectors to determine if health and safety committees are receiving adequate support from mine management.**

Worker Safety Representatives

The Committee notes that both Dr. James Ham and Mr. Kevin Burkett recommended in their reports on mining safety that there be statutory provision for worker safety representatives in each mine/mining plant. Since that time, a number of companies and their unions, have on their own initiative, negotiated full-time worker safety representatives. During the course of public hearings, the concept of statutory worker safety representatives was endorsed by most union locals in the United Steelworkers of America (USWA) and the Mine, Mill and Smelters Workers Union (MMSWU). While the concept of worker safety representative was first introduced in 1975, the appointments are relatively recent, and the role is still evolving. Workers at several of the mines suggested that basic guidelines regarding the roles and responsibilities of the worker safety representatives should be more clearly spelled out.

The Committee also heard a number of witnesses urge that worker safety representatives should be given the statutory right to shut down an unsafe operation. One worker suggested that if a worker safety representative concluded that a portion of an operation was unsafe, he/she must be given the authority to shut it down until the situation can be discussed with the mine superintendent and a solution is reached.

Committee Members heard that, for the most part, worker safety representatives are already given the authority to shut down an unsafe operation. The provision is included in the agreement between the company and the union where worker safety representatives have been negotiated.

During public hearings, workers added that the IRS will not operate properly until workers have the authority to shutdown unsafe operations. The Committee believes that with the proper training and experience, worker safety representatives would use this tool responsibly. Without it, the position of worker safety representative will lack credibility.

Swedish law gives this right to safety delegates who are appointed by the Union. Under The Work Environment Act of 1978, which applies to all industries, safety delegates may call a halt to any work they believe is dangerous to employees and may prevent an employer from resuming the operation until safety improvements are carried out or a decision is rendered by the Labour Inspectorate. The president of a Swedish mining company who is currently posted at the Swedish Trade Council in Toronto was asked if this provision of the Act was abused by Swedish workers. According to this individual, with the exception of the odd frivolous case, Swedish safety delegates do not abuse this authority. On the whole, it is used responsibly.

Recommendations:

7.1 There should be statutory provision for a full–time worker safety representative in each mine or mining plant employing more than 250 workers. Where the number of workers is less than 250, provision should be made for the appointment of a worker safety representative to spend a proportionate amount of time engaged in activities related to workplace safety.

7.2 The worker safety representative should be selected by the workers and should report to the Joint Health and Safety Committee.

7.3 worker safety representatives who are adequately trained in the Act and Regulations should be empowered by statute to order a halt to any specific operation that they believe is unsafe and may put workers at risk.

7.4 General guidelines concerning the other roles and responsibilities of the worker safety representative should be developed by a tripartite body consisting of representatives of labour, mine management and the MHSB.

Mining Safety Association

The Committee noted that the Burkett Commission directed the MAPAO to become a more independent force within the industry by establishing labour–management committees at provincial and regional levels and by taking steps to include representatives of labour and the public on its board of directors. During public hearings, the Committee learned that labour was represented on the Board for two years, but subsequently withdrew. According to the MAPAO, the number of board positions was increased from 13 to 15 to accommodate the latter, but labour did not respond to the offer.

Since the public hearings, several Committee Members learned on an informal basis that MAPAO is willing to address its major shortcoming by broadening the make up of its board of directors to include labour and public representatives.

While the Committee was encouraged by the news, Members take the view that if the safety association of the mining industry is serious about becoming an independent force within the industry, it should reflect the principle that it is a tripartite organization with equal participation on its board of directors of mine management, labour, and the public at large.

Health and Safety Education

The key responsibility of the mining safety association is education and training in safety and accident prevention in the industry. The Association carries this out through accident analysis, safety programs and supplying training materials to workers and management. During the hearings, workers commented that the MAPAO had not kept in touch with the safety education needs of workers.

Several workers commented that MAPAO could achieve greater credibility if it updated its safety training materials and oriented its programs less toward management and more toward the worker.

The Association commented that this is an area where it can improve. Recently, MAPAO attempted to address this concern by reviewing its courses, seminars and training materials to ensure that content is up to date and effective. The Association is also putting together an evaluation framework to measure whether or not its programs are having a positive effect on safety practices in the workplace.

The Committee was interested in MAPAO's response to a 1987 study[23] commissioned by the Occupational Health and Safety Educational Authority (OHSEA). The study assessed the health and safety education needs of all provincial safety associations and made 42 recommendations designed to improve delivery of service in the safety associations. The thinking embodied in those recommendations resembled that of the Committee on many issues. For example, several of the 42 recommendations suggested a need for safety associations to develop a greater health focus by integrating health issues into training programs and amending the enabling legislation of safety associations to ensure that their mandate includes educational efforts at illness prevention as well as traumatic injuries.

The Committee was informed that the MAPAO was formally canvassed by the OHSEA for its views concerning the recommendations. MAPAO has responded by identifying priorities and planning implementation strategies.

Provision of Joint Training

Earlier in the report it was noted that members of health and safety committees are eager to receive joint training in the legislation. Once trained in the Act and Regulations, representatives of health and safety committees could give new miners, undergoing the Common Core, a basic orientation to the legislation. The Committee believes that the safety association of the mining industry should provide for that training.

Participation of Diamond Drillers in MAPAO

The Committee asked the Canadian Diamond Drillers Association (CDDA) to appear before it in view of its considerable injury rate and costly WCB assessment rate ($13.11 per $100 of payroll). A representative of the diamond

drillers told Committee Members that over the past 21 years, the diamond drilling industry has had an average lost time injury rate of 14.9. While membership in the CDDA is voluntary, diamond drilling does come under the umbrella of the MAPAO, and all members are encouraged to participate in the safety programs of the Association. However, a representative of the CDDA informed Committee Members that a number of drilling companies are not participating because of difficulties inherent in their nomadic lifestyle, which involves locating considerable distances from communities where training is held.

While the Committee can appreciate that for diamond drillers the nature of the work is hazardous and rigorous – taking workers into the bush during the winter for the most part – the Committee, nevertheless, cannot accept the record number of accidents within this sector of the mining industry. The Committee further believes that diamond drillers will not show improvement in accident rates until they are more closely integrated into the safety programs of the mining industry.

The Committee has learned that the MAPAO has recently accelerated its efforts at targeting diamond drillers for priority field visits from safety association staff. MAPAO is also bringing the drillers out of the camps into the community to attend safety workshops.

In order to reduce the unacceptable accident rate in this industry, the Committee believes it is imperative that members of the diamond drill industry currently not participating in the safety association's safety programs be obliged to do so.

Recommendations:

8.1 **In order to ensure that the mining safety association becomes an independent force within the industry, the existing safety association should ensure that its board of directors is tripartite in nature with equal participation of management, labour and representation from the public at large.**

8.2 **The new tripartite mining safety association should continue to critically evaluate its safety programs and training materials to ensure that they meet the safety education needs of workers. The safety association should give serious consideration to adopting and implementing the recommendations of the Report to the Occupational Health and Safety Education Authority.**

8.3 **The new tripartite mining safety association should be responsible for providing joint training in the Act and regulations to members of workplace joint health and safety committees. Once trained, representatives of joint committees should give a basic orientation in the Act and Regulations to new miners as part of their Common Core training.**

8.4 **The new tripartite mining safety association should redouble its efforts to ensure that diamond drillers actively participate in its safety programs. The safety association should also continue its efforts at bringing the contractors out of the camps into the community to attend safety training courses.**

Mining Health and Safety Branch

The MHSB administers the Occupational Health and Safety Act and Regulations for Mines and Mining Plants. The branch also provides for periodic inspections at the following operations: mines, mining plants, pits, quarries, metallurgical operations, sand and gravel pits, aggregate plants, peat workings and diamond drill operations. Among other responsibilities, the branch also investigates fatalities, accidents and refusals to perform unsafe work.

The Committee asked the MHSB to permit several members of the branch inspectorate to appear before the Committee and give their views on accidents and fatalities in the mining industry. A number of the inspectors noted that mining activity has increased considerably because of the "flow through shares." The "flow through shares" is a tax shelter which permits investors to purchase a share of a mining exploration company and deduct $1.33 for every $1.00 invested. However, to qualify for the deduction, investors must ensure that the investment for exploration activities is spent within two years. The inspectors stated that because of the increased activity level generated by the "flow through shares", they have more sites to visit with the result that the frequency of their physical inspections to mining operations has fallen off. If the industry perceives there is a shortage of inspectors, companies may become more complacent about safety standards, according to the inspectors.

The inspectors were also of the view that with more inspectors, they could spend more time with the joint health and safety committees, auditing their practices and providing assistance and support where necessary.

The fundamental role of the MHSB inspector at each mine or mining plant is twofold: to act as an external check on the inhouse auditors (the health and safety committee and the worker safety representative) and to keep the IRS alert and responsive. The presence of the MHSB inspector is particularly crucial to mining operations with health and safety committees that are not realizing their potential and where the IRS is faltering.

While the Committee does not believe that it is necessary to double the size of the MHSB inspectorate to fulfill its audit role, the committee would like to emphasize that the MHSB should be provided with the necessary resources to ensure that its inspectors maintain a continuous presence in the field sufficient to conduct the requisite inspections, to identify and correct hazards and to promote the IRS.

Recommendations:

9.1 **The MHSB should be provided with resources to maintain enough trained inspectors to achieve a sustained presence in the workplace given the current levels of mining activity.**

9.2 **To strengthen the IRS at each mine and mining plant, copies of written reports on the performance of the IRS, prepared by MHSB inspectors and reviewed with their supervisors, should be shared with the CEO of the mining company and members of joint health and safety committees in order to give these parties feedback on the vitality of IRS .**

Noted earlier in this report was a description of the Mining Legislative Review Committee (MLRC), a tripartite body composed of mine management, labour and senior management from the Ministry of Labour. A steering committee of the MLRC reviews health and safety issues arising from fatalities, coroners' jury recommendations, accidents and near misses. It also responds to proposals made by labour, management and ministry personnel. The steering committee reviews and priorizes such recommendations, some of which may be proposed as new regulations or as an amendment to an existing regulation.

The Committee focused its attention on the role the inspectorate could play in this process since it is the inspectors who must enforce the regulations. Because of their enforcement role, inspectors are in a unique position to observe which regulations are enforceable. The Committee learned that the MHSB did have a mechanism at the branch level for communicating inspectors' concerns to the MLRC. However, the process has achieved limited success in responding to the suggestions of the Inspectorate and could be improved.

Recommendation:

9.3 The Ministry of Labour should be more responsive to the grassroot concerns of the MHSB inspectorate as they pertain to possible changes to the Act and Regulations. The Ministry should ensure that the inspectorate's input is passed on to the Mining Legislative Review Committee for consideration.

The Committee heard from a number of witnesses who stated that the enforcement process of the Act and Regulations is too slow. Section 40 of the Occupational Health and Safety Act states that no prosecution under the Act can be instituted more than one year after the last act or default upon which the prosecution is based. One mine manager noted that if an accident occurs and a supervisor suspects s/he will be charged, it is agonizing to wait up to six months or longer to find out if, in fact, s/he will be charged.

Several members of the Mine Inspectorate noted that to be effective, sanctions must occur soon after the offence. The slow processing of charges is having an adverse effect on safety in the workplace, according to several of their members. Not only is the internal process slow (up to a year), but once a prosecution is filed with the courts, that process, in turn, takes time. The Committee believes that the Ministry should take steps to streamline internal procedures in order to shorten the time between the offence and the laying of a charge.

The Committee also concurs with a number of witnesses who believe that the penalties and fines for contravention of the Act and Regulations are too low and fail to communicate the seriousness of the offence or effectively deter those who break the laws relating to health and safety in the workplace.

Recommendations:

9.4 The Ministry of Labour's MHSB should shorten the period of time between the laying of charges following the commission of the offence by streamlining internal procedures. This time period should be shortened from a year to three or six months.

9.5 Penalties and fines for contravention of the Act and Regulations should be increased.

Professional Training

The Committee noted the Burkett Commission's concern that there is a shortage of graduate mining engineers with a specialty in rock mechanics and that in the Commission's view, each mining company should have a rock mechanics engineer on staff with training at the post-graduate level. The Committee also noted the Stevenson Inquiry's concerns that although engineers with graduate and post-graduate qualifications have a theoretical understanding of the concepts of rock mechanics, such students lack an adequate understanding of how to apply these theories to day to day practical ground control problems.

The Committee is also aware that special chairs in rock mechanics have been established at three universities: Laurentian, Queen's and The University of Toronto, to improve the standard of instruction in rock mechanics at the graduate and undergraduate level. The question of how qualified an engineer must be to assume responsibility for the day to day mine design and practical ground control functions has generated some debate. The Burkett report recommended that each company should have a resident rock mechanic engineer with training at the post-graduate level. The industry and others argue that mine design should be under the direction of a technically competent person.

One of the recommendations of the Stevenson Inquiry that generated consensus among representatives from the academic community and the industry, was the suggestion that the mining industry be encouraged to sponsor qualified employees who seek post-graduate degrees in rock mechanics. According to representatives of the industry, companies are already sponsoring qualified employees to obtain post-graduate courses in rock mechanics and will continue to do so. The Committee agrees with this strategy. The Committee

recognizes that a requirement to have a professional engineer on staff with post-graduate qualifications in rock mechanics may be difficult in the short term due to the shortage of qualified engineers. However, the requirement is not unrealistic in the long term, particularly if mining companies continue to sponsor engineers to undertake this training.

Recommendation:

10.1 Mining companies should continue to sponsor engineers within their own companies to return to university and undertake post-graduate courses in rock mechanics.

Ground Control

During the tours of various underground mines, the Committee learned that scaling and bolting are among the most hazardous jobs in the mine environment. According to the Ministry of Labour submission to the Committee, between 1974-1987, 22% of fatal accidents were caused by falls of ground. The MAPAO provided the Committee with a computer print of all its scaling accidents between 1984 and 1987. During that period there were two fatalities and 85 lost time injuries attributable to scaling. Of the reported accidents, 20% involved serious injuries such as fractures and 20% involved crushing bruises.

At one of the salt mines visited by the Committee, members were told that the "scalers" who pry loose rock from the ceiling account for 15% of the workforce yet accounted for 39% of the accidents. Many of the injuries recorded by the MAPAO involved being struck by falling "loose" rock. A significant proportion of the accidents resulted in back injuries. The Committee believes that since scaling and bolting tend to be hazardous activities both in the softrock and hardrock mines, a longer period of closely supervised training should be required under the auspices of the Common Core.

The Committee is also of the view that in the underground salt mines mechanical scaling is safer than manual scaling. Mechanized scaling involves the operator being located 16 - 24 feet away from the area being scaled and is protected with overhead fall on protection. The tooth on the mechanical scaler merely scrapes along the ceiling pulling down the loose slabs of salt. At

one of the salt mines that used a mechanical scaler, there were no reported injuries associated with mechanical scaling.

Manual scaling, on the other hand, places workers at greater risk. It involves "sounding" of the roof with a scaling bar to detect and pry loose rock. Injuries are caused from falling loose rock. They are also caused by pulled muscles, strains and bruises because of over-exertion when attempting to dislodge the loose rock.

Recommendations:

11.1 **As scaling and bolting are among the most hazardous jobs in the mine environment and can result in serious injury, this aspect of the Common Core should be critically reviewed by the Tripartite Committee with a view to increasing the length of training under supervision. Periodic refresher courses in scaling and bolting techniques must be required to facilitate early detection of improper techniques and procedures.**

11.2 **Where practicable, softrock salt mines should utilize a mechanical scaler to alleviate the record number of injuries caused by manual scaling.**

In one of the underground softrock mines toured by the Committee, the Members observed rockbolts extending below the ceiling in a passageway, signalling a need for re-bolting. In this same mine, the Committee witnessed considerable debate between mine management and several workers concerning proper scaling and bolting practices at the mine. Several workers contended that areas of the mine roof were not scaled properly and that certain areas of the mine required full coverage of rockbolts.

Mine management, on the other hand, argued that extensive coverage of rockbolts in particular areas of the mine roof was not necessary as there is less stress per square inch in the softrock mines. It is the Committee's hope that the parties resolve the dispute between themselves concerning competing ground control strategies. Failing that, officials at the MHSB should be consulted for guidance. In view of the Committee's first hand observation of rockbolts extending from the roof, the Committee recommends that substandard conditions involving scaling, rockbolting or re-bolting of the roof in all mining establishments be addressed in a timely manner.

Recommendation:

11.3 To guard against the hazard of falling "loose" rock, mine management in all mines should ensure that proper scaling and bolting techniques are carried out as required including re–bolting in passageways.

The Committee's attention was drawn to the safety hazard presented by falling "loose" rock that was documented in the Burkett Report and highlighted in the MHSB accident statistics, which stated that 22% of fatal accidents between 1974–1987 were caused by falls of ground. The Committee reviewed the new regulation concerning overhead fall on protection devices which was implemented following the Stevenson Inquiry. Fall on Protection Systems (FOPS) are devices that protect vehicle operators from falling objects.

Regulation 66a of Ont. Reg. 258/87 under the Occupational Health and Safety Act requires fall on protection devices to be installed on all underground vehicles in new underground mines developed after June 1, 1988, or, in areas of older underground mines deemed unsafe by Ministry of Labour engineers. The devices are required to withstand a given standard of force. A provision of the regulation concerning the new mines exempts such mines from the overhead protection requirement on vehicles if these vehicles operate in an area made safe by scaling, timbering, rockbolting, or, equivalent safety measures.

While the Committee is pleased to see a regulation in place concerning Fall On Protection Systems, the Committee nevertheless feels that this regulation is significantly weakened by the provision that exempts new mines from providing fall on protection, if such mines meet the above–noted criteria. In the Committee's view, such measures are not fool–proof in terms of protecting an underground vehicle operator from falling loose rock, and overhead protective devices should still be required to supplement the aforementioned safety measures.

Recommendation:

11.4 Fall on protection systems that are required according to the new regulation O.Reg. 258/87 – 66a. should not exempt new mines made safe by scaling, timbering, rockbolting or by equivalent safety measures.

Mine Lighting

The issue of lighting in underground mines was identified as a key concern by this Committee as well as previous commissions of inquiry. The Committee notes that the Burkett Commission directed the MAPAO to undertake a comprehensive research program to determine optimum lighting levels required for various underground work areas, to identify practical lighting systems for the underground environment, and to quantify the measurable effects of improved lighting on productivity, equipment damage, absenteeism, turnover, accidents, etc. The MAPAO noted in their submission to the committee that the issue of lighting has been addressed. The safety association has prepared a text which discusses the state of the art of workplace illumination. They also co-sponsored a seminar on mine lighting and are embarking on a "roadshow" to bring lighting technology with an emphasis on cap lamps to all provincial mining operations.

The issue of lighting in underground mines generates some debate. A number of workers expressed that the light from the miner's cap lamp is insufficient. They suggest that the lack of sufficient lighting is compromising worker safety and that mines should be better illuminated. On the other hand, mine management and a number of professional engineers point out that auxilliary lighting could create a safety hazard in passageways. They argue that vehicle operators have a better chance of identifying a miner by his/her cap lamp in an unlit environment.

They also point to the difficulties of installing permanent auxilliary lighting in mines where mine methods involve continual blasting. However, they add that permanent lighting is more practical in situations involving vertical retreat mining methods because with this type of mining, the working area is opened up for a year or longer.

The Stevenson Inquiry noted in its report that poor lighting can contribute to underground accidents and concluded that improved underground lighting was required. That Inquiry helped generate new regulations concerning mine lighting underground. Ontario Regulation 258/87 65a (which came into force June 1, 1988) requires provision of adequate illumination to enable workers to assess ground conditions at the workplace. The lighting source is either a cap

lamp (which must meet a certain standard of illumination), or, an auxilliary source of illumination such as a hand held battery lamp which can be used when the distance of the ground to be assessed extends beyond the effective range of the cap lamp.

While the Committee approves of the action taken by the industry and the Ministry to improve the standard for illumination of cap lamps, Members believe that the regulation does not address the problem of inadequate lighting that persists in a number of underground work areas. The Stevenson Inquiry recommended in its report that one of the subjects that the newly created Mining Research Directorate should consider was mine lighting. However, when the Mining Research Directorate published a list of twenty potential projects in July 1987, mine lighting was no longer on the list.

As noted earlier, the MAPAO addressed a number of lighting issues that were directed to them by the Burkett Commission. However, nowhere in the MAPAO's report to the Committee did the safety association discuss the status of the research project concerning measurement effects of improved lighting on productivity, equipment damage, absenteeism, turnover, accidents, etc., that was also referred to the MAPAO by Burkett.

The Committee felt uncomfortable with existing lighting levels at the miner's workplace in underground mines and believes that safety would be enhanced through the provision of auxilliary, stationery lighting.

Recommendations:

12.1 Mining companies should provide auxilliary lighting which could be free standing or attached to equipment at the miner's work place in all underground mines in order to supplement the light from the miner's cap lamp.

12.2 The mining regulations should be amended to require that open holes in underground mines are fenced off and include red flashing lights to warn of the hazard.

Underground Communications

The issue of miners working alone underground was raised as a safety concern during the Ham Commission and the matter generated similar concern for the Standing Committee. One of Dr. Ham's recommendations, which remains outstanding, is the requirement that all fatalities/serious injuries to persons working alone be the subject of biennial review by the MHSB. The Committee has recommended elsewhere in this report that the MHSB take steps to initiate this review of all "working alone" fatalities/serious injuries with a view to gaining a clearer picture of the extent of this type of accident/fatality.

The current regulatory provision (15. of Regulation 694 under the Occupational Health and Safety Act) states that to work alone, a person must be competent and must be visited by a supervisor/designate at least three times per shift. However, if work conditions are standard and a means of communication is provided between the worker and the supervisor/designate and a record is kept of the communication, the worker may be visited only once per shift.

The Committee was not comfortable with the current regulatory provision concerning miners working alone. The Committee took the view that where miners work alone and underground radio/telephone communications are inadequate in terms of facilitating routine supervisory contact, such workers should be allowed to work in close proximity of each other, i.e. within hearing or seeing distance. The Committee reasoned that where miners work alone, a "buddy system" is required to supplement the three supervisory visits per shift. With this system, a worker who has injured himself shortly after a supervisory visit has a better chance of survival if he or she could call out to a co-worker in reasonably close physical proximity. Without such assistance, the injured worker could wait for up to two and half hours for the next supervisory visit.

Recommendation:

13.1 **In all underground mines, workers should have access to a direct means of communication with their supervisor/designate and make contact at least once every two hours in addition to the one regular supervisory visit currently required per shift. Where there is no means of communication available between worker and supervisor,**

workers should be required to work in reasonably close physical proximity to each other (in addition to the three supervisory visits currently required per shift).

Refuge Stations/Lunch Rooms

During the Committee's tour of mines, the Committee often visited the refuge stations underground. Refuge stations are used by workers in cases of underground emergency such as fires. They are constructed of fire resistant materials and contain a means of voice communication with the surface, a supply of compressed air and drinking water. Refuge stations also serve as lunch rooms for employees working underground.

It was brought to the Committee's attention that the regulation respecting the use of lunchrooms applies only where fifteen or more people congregate to eat their lunch. According to one union representative, workers in one of the mines were prohibited from eating lunch in lunch rooms unless the criteria was strictly met. Workers expressed that the regulation was too arbitrary.

The Committee also learned from workers in another mine that over one year ago, four workers underground were forbidden from using the underground lunch room and instead were instructed to eat lunch in the stope where there was no washing facilities, lights or seats.[24] While the latter situation was eventually addressed by the company, the Committee took the position that all underground workers should be allowed to eat their lunch in the underground lunch room whether or not there are a minimum of fifteen workers congregated to eat.

Recommendation:

14.1 All mines should be equipped with refuge stations and lunch rooms underground and should be made available to all underground workers who wish to eat there.

Illiteracy

The Committee noted that several witnesses raised the issue of illiteracy as a possible contributing factor in mining accidents. Submissions by the Mining Inspectorate noted that illiteracy was not a significant factor in mining

accidents but noted that illiteracy could pose safety problems particularly if workers could not read signs.

The MHSB reported in their submission that illiteracy may contribute to accidents by blunting the effectiveness of safety awareness programs. The OMA recommended that government should support literacy programs by providing incentives to companies to participate.

In a 1988 publication entitled, Measuring the Costs of Illiteracy in Canada, that was prepared by the Canadian Task Force on Literacy, the document states that literacy related accidents are estimated to cost Canadian business approximately $1.6 billion. The report noted that while there are no published 'hard' data on accidents attributable to illiteracy, the Advisory Council on Occupational Health and Occupational Safety notes that workers with less than grade 9 are overrepresented in a number of 'high risk' industries. Moreover, the Council discovered that non–English speaking workers and illiterate workers were over represented at the Ontario Workers' Compensation Board Hospital and Rehabilitation Centre in Toronto in 1976.[25]

During the public hearings, Members learned that the MAPAO's safety materials/services are all in English and very marginally in French. The Committee also notes that in the report to the Occupational Health and Safety Educational Authority (OHSEA) noted earlier, several recommendations addressed themselves to the issue of illiteracy among workers, and the need to reach workers with no more than a primary school education or a poor command of the English language. The thrust of the recommendations directed safety associations to consider the needs of such workers when designing training materials.

To address such communication disparities, safety delivery agencies were asked to consider developing "more materials which convey the health and safety message graphically or visually, such as posters, graphic manuals, videotapes or television spots[26]" and to consider the average educational level of workers when designing such materials. The Committee endorses such recommendations and believes that now is the time for the industry to take steps to alleviate illiteracy as a factor in industrial accidents.

Recommendation:

15.1 **As illiteracy is a pervasive social problem and studies have shown that workers with less than grade 9 education or a poor command of English are overrepresented in a number of 'high risk' industries, training materials in the mining industry should be creatively designed so as to be understood by those with lower levels of education. Consideration should also be given to using videotapes as a safety training tool and translating training manuals into the language of the predominant ethnic group in the mine if English is not the first language of such workers.**

Contractors

The Burkett Report highlighted the safety record of mining contractors: shaft sinking and mining contracting, general contracting, and diamond drilling. Burkett had noted that the safety record of contractors as a group had not been good.

During the public hearings the Committee learned that the lost time injury rate (LTI) for diamond drillers is considerably higher than the rest of the mining industry. In 1987, the LTI rate was 14.4 per 200,000 hours worked for diamond drillers and 6.7 for mining contractors compared to 3.9 for the mining industry as a whole.[27] With respect to fatalities, mining contractors had the highest fatality frequency in 1987. Moreover, mining contractors experienced 19 fatalities between 1980–1987. Mining contractors respond that accident frequency comparisons should be made with mining operations having a similar exposure risk, such as underground operations rather than comparing the accident frequency based on total hours alone of the industry.

It is the Committee's view that the number of fatalities and injuries in the contracting group is excessive and must be addressed. Committee Members were told by the representative of the Canadian Diamond Drill Association that there is no common Core Training Program for Diamond Drillers. When a new person is hired, he works with someone with experience and learns the duties through on–the–job training. New drillers or "helpers" assigned to assist diamond drillers may be put in situations where they will be asked to handle equipment that they have never handled before such as chainsaws and pipe–wrenches.

While the Committee recognizes that the diamond drill association members attempts to instill the new workers with positive safety habits, on-the-job training is no substitute for a Common Core training, which is what the mining companies put new miners through during the first year of employment. The Committee was impressed with the Common Core training efforts of the mining companies and would like to see new diamond drill employees, and workers employed by mining contractors given Common Core safety training before being allowed to work on contractors' projects.

Recommendations:

16.1 **Because of the accident rate among high risk personnel such as diamond drillers and employees of mining contractors, new workers in these operations should receive safety training modelled on the Common Core before they begin their job and receive refresher courses at regular intervals.**

16.2 **While the Common Core, or key safety aspects of it will be made available to non-mining personnel who work underground, – e.g., tradespeople, construction workers, clerks, geologists, samplers, etc., such personnel should receive refresher courses in these basic safety and ground control skills.**

First Aid Stations

The Committee learned during the public hearings that the diamond drilling industry has experienced a poor accident record over the past 21 years. Their average lost time injury frequency rate (LTI) is 14.9. According to a representative of the Canadian Diamond Drilling Association who appeared before the Committee, one of the reasons for the severe LTI rate among diamond drillers is that there are no designated areas for first aid at the diamond drill camps. Therefore, when a worker becomes injured, he must be flown out by helicopter.

The nomadic lifestyle of diamond drilling does not lend itself to the luxury of first aid stations, according to this representative. He added that while three out of four workers in the camps are required to have first aid certificates, this provision is only slowly taking hold. He suggested that if areas designated for first aid were estabished in the larger camps and workers were trained in first aid at the standard level, the lost time injury rate among diamond drillers would be halved.

Ontario has statutory provisions governing first aid requirements under Regulation 950 of the Workers' Compensation Act. The Committee recently learned from the WCB that Regulation 950 is currently under review and that revisions to the Regulation are being closely coordinated with the MHSB of the Ministry of Labour and the Mining Legislative Review Committee.

The representative from the Canadian Diamond Drillers Association also noted that there is good radio communication between the main camp and drill sites. This is a crucial link especially when a driller has been injured and must be flown out. The representative noted, however, that there have been cases where workers did not know how to operate the radio, or the radio had been turned off. In one instance, the radio had been left several hundred feet away from the drilling rig when a driller injured himself. A pilot happened to be flying overhead and when the helper ran out and waved to signal that something was wrong, the pilot thought the helper was just saying "Hi" and kept on going.

While the Committee regards review of first aid provisions under Regulation 950 as a timely and positive step, the Committee nevertheless feels a need to urgently address the first aid requirements affecting high risk, remote operations such as diamond drilling.

Recommendations:

17.1 **Pending the final determination concerning Regulation 950 under the Workers' Compensation Act, currently under review, companies engaged in diamond drilling should take immediate steps to ensure that all workers employed in these remote locations are trained in first aid and have their first aid certificate before being allowed to work in the camps.**

17.2 **Diamond drill companies should ensure that their workers are properly trained in radio communications between the main camps and sub camps before being employed in these remote locations. There should also be an improved system of communications between pilots and workers on the ground to assist diamond drillers when radio communication is impaired.**

Drugs and Alcohol

During the public hearings the Committee was informed by the MAPAO that the safety association was unable to carry out a study to determine the extent of the relationship between alcohol and drug use and accidents in the mining industry recommended by the Burkett Commission. They stated that this was because of difficulties in obtaining the concurrence of all parties involved and the fact that the association dues not have the legal authority to gain access to confidential information necessary to undertake such a study.

The Committee is aware that alcohol and drug abuse is not unique to the mining industry. However, this problem cannot be disregarded as a contributing factor in mining accidents. A study undertaken by the British Columbia Ministry of Labour and Workers' Compensation Board noted that 10 per cent of employees are either alcoholics or problem drinkers, according to federal government statistics.[28] A safety article which preceded the study indicated that 15 per cent of B.C. workers killed on the job over the past five years had some alcohol or non–prescription drugs in their system at the time of death.[29]

The Committee heard that alcohol and drug abuse was a problem in the mining industry, particularly in the remote camps of the diamond drill contractors. According to a representative of the Canadian Diamond Drill Association, the isolated camps are supposed to be maintained dry but drug abuse, which is less detectable than alcohol, remains a problem.

The Committee is aware that the impairment of workers through drugs, alcohol or other substances not only creates a safety hazard to the impaired worker, but endangers other workers. Impairment of one's faculties in an industry such as mining is all the more serious due to the limited lighting and the prevalence of heavy equipment and other hazards.

Although a study concerning the extent of drugs and alcohol in the mining industry was not carried out, the Committee feels confident in recommending to the mining industry various strategies designed to address the problem of drugs and alcohol in the workplace. The Committee believes that as an important first step, supervisory personnel need to be educated about the disease of alcoholism/drug addiction, particularly identification/intervention initiatives.

Next, the Committee believes workers need to be educated about the nature of alcohol/drugs and their effects in a high risk environment. The Committee learned that a number of mining companies already have employee assistance programs (EAP) available to their employees. First aid attendants in diamond drill sites and all other mining operations should also receive specialized training in understanding and identifying the problem of alcohol/chemical abuse.

Lastly, because personnel in diamond drill operations may succumb more readily to drugs/alcohol because of the remoteness and isolation of the camps, the Committee recommends that diamond drill companies should explore the possibility of developing enhanced recreational activities.

Recommendation:

18.1 Mining companies should ensure that mine supervisory personnel receive training in identification and intervention strategies associated with alcohol/drug abuse among employees. Employees should be trained about the nature of alcohol/drugs, particularly the risks associated with combining drugs and/or alcohol with a high–risk operation such as mining.

18.2 All mining companies should either have EAP, or, make this service available to their employees.

18.3 First Aid attendants at all mining operations, particularly isolated diamond drill sites should receive specialized training in understanding and identifying the problem of alcohol/chemical abuse.

18.4 Diamond drill companies should endeavor to provide enhanced recreational activities in remote diamond drill camps to alleviate the isolation and boredom.

Production Bonus

At the beginning of public hearings members of the Committee felt uneasy about "the bonus system" – a method of remuneration based on piecework whereby miners are paid a basic wage plus a bonus if they produce over a specified amount. With this standard hour incentive plan or "bonus" system, separate incentive contracts are developed for groups of workers for a period of usually one month. Approximately 50 percent of the underground mining workforce earn bonus. The Burkett Report noted that the less productive bonus miners earn at least 120 percent of their base rate, while a superior incentive miner may earn upwards of 200 percent of his/her base rate.[30]

The rationale behind the bonus system is to motivate workers to work faster and smarter in a setting where there is no continuous supervision. The Burkett Commission believed that the bonus system compromised safety in the underground environment because, in the absence of direct supervision, there is no means of monitoring the behaviour of workers who attempt to maximize earnings. Whereas for the most part, the most productive bonus miners are also the safest miners, the Committee's concern and that of Burkett's focused on the worker who may over–extend or abuse his equipment, work at a pace which brings fatigue, take short cuts or otherwise deviate from standard practices in an attempt to realize maximum potential earnings.[31]

Burkett concluded that there was a relationship between the production bonus in effect in most Ontario mines and the number and severity of accidents. The Commission recommended that the mining companies and their unions discontinue individual (small crew) production incentive plans. Failing voluntary discontinuance, Burkett also recommended that government legislate an end to these incentive plans.

Following the release of the Burkett Report, the OMA commissioned a study by consultant Peter Moon to consider the relationship between small crew incentives and other factors and accident rates in Ontario mines. The study concluded that bonus has no impact on accident rates when other factors such as age, occupation, experience and risk are taken into account. Preliminary findings of a study carried out by Laval University for the Quebec Metal Mining Association suggest that while bonus has a slight impact on underground accidents for production–related activities, it also indicates that other factors such as orientation to the mine environment, training and retraining have as much or even more weight on accident frequency and severity rates. The Mining Legislative Review Committee (MLRC) agreed unanimously in September 1986 to not support the elimination of the bonus system and a survey of Joint Health and Safety Committees in Ontario mines concluded that in their opinion bonus did not adversely affect safety.

The Committee heard evidence from workers who suggested that the incentive system is not a hazard to miners if they work properly. Other miners noted that it is possible to work safely at an incentive pace. One large mining company noted that adequate allowances for safety, travel, breaks and machine

downtime are factored into the calculations of standard work performance on which the incentive system is based. Several witnesses suggested that the bonus system could be restructured to build in incentives for safe performance as well as production targets.

On the other hand, Members heard from representatives of the Ministry's inspectorate who suggested that the bonus system could be a possible factor in mining fatalities particularly among contractors, where the majority of employees, including supervisors, are on a bonus contract. Contractors pay bonus according to how much progress is made in advancing tunnels and shafts, according to inspectors.

The Standing Committee also examined the thinking of the tripartite Mining Fatalities Committee concerning bonus. The MHSB prepared a study on bonus accidents which concluded that there is no statistical evidence available to determine whether or not injuries are affected by incentive plans. The tripartite committee recommended the following four-pronged approach:

- Mining Fatalities Committee to assess whether the incorporation of a safety component into existing bonus systems would enhance safety;
- As part of all critical/fatal accident investigations, the MHSB analyze whether or not bonus was a contributing factor;
- MAPAO to compile similar accident statistics comparing workers doing similar tasks under the various incentive schemes and publish these trends on an annual basis;
- Following the completion of the Laval Study on bonus systems, their findings should be reviewed to determine if the results of their preliminary study are confirmed;

The Standing Committee on Resources Development concurs with the approach of the Mining Fatalities Committee.

Although the Committee initially felt uneasy about a piecework system in an unsupervised environment which may prompt workers to cut corners in order to maximize earnings thereby compromising safety, the Committee did not believe it had sufficient conclusive evidence to recommend that the bonus system should be eliminated outright.

Recommendations:

19.1 The tripartite Mining Fatalilties Committee should pursue their four initiatives designed to generate more conclusive evidence concerning the possible link between incentive bonus and accidents.

19.2 Following completion of the Laval Study, the findings should be reviewed by the tripartite Mining Fatalities Committee to determine if changes in the bonus system should be recommended to the provincial government.

Mining Research

During the course of public hearings, the Committee was informed by witnesses from the academic community that mining departments of universities are excluded from bidding on contract–type mining research in favour of industrial companies. The rationale behind this is to enable small business to create research capabilities within the business sector. However, the Committee was told by one witness that excluding universities from competing for research projects on an equal footing with industrial concerns is depriving post–graduate and undergraduate students, who would be employed as research assistants on these projects, from relevant learning opportunities.

The Committee was also told that availability of funding for university–sponsored mining research is a concern among mining engineering professors. Members were informed that the principal source of funding for engineering professors is the Natural Science and Engineering Research Council (NSERC). However, NSERC does not have a mining subcommittee. Consequently, mining research proposals are reviewed by civil engineering and chemical engineering committees which do not have the same appreciation for solving mining engineering problems that mining engineers have. The success rate for university funding of mining related research from NSERC has therefore been low.

The Committee was informed, however, that the establishment of the Mining Research Directorate may generate new opportunities for funding of mining research.

The Committee was also informed that the United States and South Africa spends approximately three times as much as Canada on health and safety research in mining. The Committee subsequently learned from senior staff at

the Canadian Centre for Mineral and Energy Technology (CANMET) that it has retained the Centre for Resource Studies at Queen's University to conduct an international comparison of efforts in mineral-related Research and Development. The final report is expected this July.

The message conveyed by these witnesses is that there needs to be more resources devoted to universities to undertake mining research projects aimed at safe production. Research dollars provided to the universities through NSERC and CANMET are too few.

Recommendations:

20.1 Universities as well as industrial companies should be invited to bid on contract mining research involving safe production, and any impediments that exist should be removed.

20.2 The provincial government should encourage the NSERC to create a mining subcommittee to assist universities to achieve a higher level of funding for mining research related to safe production;

Ergonomics

The Committee was informed by witnesses that ergonomics is one area of mining health and safety where more research dollars could be spent. Also known as "human factors engineering", ergonomics is the study of the relationship between man, machine and the working environment.[32] According to a paper presented to a meeting of the Mines Accident Prevention Association, while human factors should be the primary consideration in the original equipment or workplace design to maximize well-being and performance, these factors were not always considered in the design stage with the result that industry must now contend with hazardous equipment and work situations which ergonomists must now attempt to modify.[33]

The paper went on to say that ergonomic design is gaining a foothold in mining operations throughout the province. At one mine, hoistmen who were experiencing stiffness to the lower limbs, were outfitted with a new seat which eliminated the problem. Trolley haulagemen who were experiencing back injuries received modified swivel seats, improved cab climate control, and improved locations for brake controls and emergency sound buzzers.

According to one witness, the awareness of human factors considerations in industry will reap positive results, and reduce accidents and injuries. However, Canada does not have an indigenous research capability in this area and must rely on the United States and Britain. He suggested that the mining industry in Ontario stimulate the development of local experts in this field, including a capability to manufacture ergonomically designed safety equipment.

It was also recommended that stable research funding should be directed toward universities to conduct independent research in this field. The Committee agrees, noting that ergonomics should be a key consideration in the design and organization of work, mining equipment, and safety apparel. The Committee further believes that this area should receive more attention and financial support.

Recommendation:

21.1 Mining management should ensure that "human factors" are a primary consideration in the design and organization of work. Where possible, new mine equipment and safety apparel ordered by the company should be ergonomically designed. Existing equipment, tools and work processes deemed hazardous should be modified. Mining companies and governments at the federal and provincial levels should increase funding to universities to enhance ergonomic research which could be applied to the mining industry.

Occupational Illness/Disease

Although the study of occupational illness and disease was not in the Committee's terms of reference, the Committee heard several presentations which underscored the seriousness of the issue. Some witnesses argued that miners are more concerned about health and occupational disease than about traumatic accidents and injuries. According to statistics supplied by the WCB, in 1987 there were 1,253 occupational disease claims, versus 1,176 injury claims in the mining industry. Between 1982 and 1986, illness fatalities outnumbered injury fatalities in the mining industry. The number of industrial disease claims in the mining industry is almost double the total number of industrial disease claims in other industries.

In view of the statistical evidence concerning industrial disease claims, and the concern that this issue has created among miners and their labour unions, the Committee believes that this issue merits the further attention of the government and the industry.

Recommendation:

22.1 The government should could continue to study the occupational illness and disease concerns of miners with the assistance of competent professionals, in order to establish appropriate diagnostic and intervention strategies designed to prevent a recurrence of past problems.

CONCLUSION

The Committee regarded its study of mine safety in Ontario as a worthwhile learning experience. Each mine visited had an operational aspect that was unique. This gave Members an appreciation for the diversity that characterizes mining in Ontario. Such diversity made the task of proposing safety recommendations, to address the range of mining operations, an interesting challenge. It is the Committee's hope that the Government will give urgent consideration to these recommendations and provide a comprehensive response.

SUMMARY OF RECOMMENDATIONS

Standard Definition of Accident

1.1 A working group comprised of representatives from the mining safety association, the Mining Health Safety Board, the WCB and organized labour should be formed in order to establish a standard definition of an accident. The working group should also establish standardized criteria to assist mine personnel to determine how accidents of a certain level of severity should be reported.

Accident Database

2.1 In order to develop "population at risk" data, the mining safety association should require mining companies to provide, via their personnel records, aggregate information on an annual or biennial basis concerning the number of workers within defined subgroups (e.g. age, years of service, shift).

Chief Executive Officer

3.1 The CEO of each mining company in Ontario should demonstrate accountability for the safe performance of the organization by personally reviewing reports of each accident and fatality, and, once annually affirm in writing that this review has been conducted. Copies of this statement should be made available to the Joint Health and Safety Committee(s) of the Company.

3.2 The CEO should assume responsibility for the "fail safe" concept in mine design, mining equipment and production procedures.

3.3 The CEO should ensure that mine management works with employees and unions to address the problem of "innocent absenteeism" through better use of existing counselling programs such as EAP, or, the promotion of a more challenging, positive working environment.

3.4 The CEO should ensure that he/she is kept informed of the company's strategies to address the problem of innocent absenteeism.

3.5 The CEO should ensure that where written communication to workers concerning chronic absenteeism is required as a last resort, these concerns should be communicated in a more sensitive manner.

First Line Supervisor

4.1 To ensure that First Line Supervisors function as part of the Internal Responsibility System (IRS), Supervisors should be required to obtain more comprehensive training in the Occupational Health and Safety Act and Regulations along with regular refresher training.

Worker

5.1 To understand their rights and responsibilities under the legislation and to function properly as members of the IRS, workers should receive more comprehensive training in the Act and Regulations within the first year of employment under the umbrella of Common Core training and receive regular refresher courses.

5.2 The Guide to the Occupational Health and Safety Act should be more widely distributed among workers in the mining industry.

Joint Health and Safety Committees

6.1 Members of Joint Health and Safety Committees should be required to participate in joint training designed to expand health and safety committees' awareness of the Act and Regulations and to enhance understanding of the roles and responsibilities of committee members. The provision of joint training in health and safety should be the responsibility of the mining safety association.

6.2 Once properly trained in the Act and Regulations, members of the Joint Health and Safety Committees should in turn be permitted to teach workers undergoing Basic Common Core Training for the purpose of familiarizing workers with the Act and Regulations.

6.3 Mine management should be required to provide written responses to all recommendations of the Joint Health and Safety Committees particularly when a Committee recommendation is rejected by mine management. Copies of all Joint Health and Safety recommendations and their responses should be audited by MHSB inspectors to determine if health and safety committees are receiving adequate support from mine management.

Worker Safety Representative

7.1 There should be statutory provision for a full–time worker safety representative in each mine or mining plant employing more than 250 workers. Where the number of workers is less than 250, provision should be made for the appointment of a worker safety representative to spend a proportionate amount of time engaged in activities related to workplace safety.

7.2 The worker safety representative should be selected by the workers and should report to the Joint Health and Safety Committee.

7.3 Worker safety representatives who are adequately trained in the Act and Regulations should be empowered by statute to order a halt to any specific operation that they believe is unsafe and may put their workers at risk.

7.4 General guidelines concerning the other roles and responsibilities of the worker safety representative should be developed by a tripartite body consisting of representatives of labour, mine management and the MHSB.

Mining Safety Association

8.1 In order to ensure that the mining safety association becomes an independent force within the industry, the mining safety association should ensure that its board of directors is tripartite in nature with equal participation of management, labour and representation from the public at large.

8.2 The new tripartite mining safety association should continue to critically evaluate its safety programs and training materials to ensure that they meet the safety education needs of workers. The safety association should give serious consideration to adopting and implementing the recommendations of the Report to the Occupational Health and Safety Education Authority.

8.3 The new tripartite mining safety association should be responsible for providing joint training in the Act and regulations to members of workplace joint health and safety committees. Once trained, representatives of joint committees should give a basic orientation in the Act and Regulations to new miners as part of their Common Core training.

8.4 The new tripartite mining safety association should redouble its efforts to ensure that diamond drillers actively participate in its safety programs. The safety association should also continue its efforts at bringing the contractors out of the camps into the community to attend safety training courses.

Mining Health and Safety Branch

9.1 The MHBS should be provided with resources to maintain enough trained inspectors to achieve a sustained presence in the workplace given the current levels of mining activity.

9.2 To strengthen the IRS at each mine and mining plant, copies of written reports on the performance of the IRS, prepared by MHSB inspectors and reviewed with their supervisors, should be shared with the CEO of the mining company and members of joint health and safety committees in order to give these parties feedback on the vitality of IRS .

9.3 The Ministry of Labour should be more responsive to the grassroot concerns of the MHSB inspectorate as they pertain to possible changes to the Act and Regulations. The Ministry should ensure that the inspectorate's input is passed on to the Mining Legislative Review Committee for consideration.

9.4 The Ministry of Labour's MHSB should shorten the period of time between the laying of charges following the commission of the offence by streamlining internal procedures. This time period should be shortened from a year to three or six months.

9.5 Penalties and fines for contravention of the Act and Regulations should be increased.

Professional Training

10.1 Mining companies should continue to sponsor engineers within their own companies to return to university and undertake post–graduate courses in rock mechanics.

Ground Control

11.1 As scaling and bolting are among the most hazardous jobs in the mine environment and can result in serious injury, this aspect of the Common Core should be critically reviewed by the Tripartite Committee with a view to increasing the length of training under supervision. Periodic refresher courses in scaling and bolting techniques must be required to facilitate early detection of improper techniques and procedures.

11.2 Where practicable, softrock salt mines should utilize a mechanical scaler to alleviate the record number of injuries caused by manual scaling.

11.3 To guard against the hazard of falling "loose" rock, mine management in all mines should ensure that proper scaling and bolting techniques are carried out as required including re–bolting in passageways.

11.4 Fall on protection systems that are required according to the new regulation O.Reg. 258/87 – 66a. should not exempt new mines made safe by scaling, timbering, rockbolting or by equivalent safety measures.

Mine Lighting

12.1 Mining companies should provide auxilliary lighting which could be free standing or attached to equipment at the miner's work place in all underground mines in order to supplement the light from the miner's cap lamp.

12.2 The mining regulations should be amended to require that open holes in underground mines are fenced off and include red flashing lights to warn of the hazard.

Underground Communications

13.1 In all underground mines, workers should have access to a direct means of communication with their supervisor/designate and make contact at least once every two hours in addition to the one regular supervisory visit currently required per shift. Where there is no means of communication available between worker and supervisor, workers should be required to work in reasonably close physical proximity to each other (in addition to the three supervisory visits currently required per shift).

Refuge Stations/Lunch Rooms

14.1 All mines should be equipped with refuge stations and lunch rooms underground and should be made available to all underground workers who wish to eat there.

Illiteracy

15.1 As illiteracy is a pervasive social problem and studies have shown that workers with less than grade 9 education or a poor command of English are overrepresented in a number of 'high risk' industries, training materials in the mining industry should be creatively designed so as to be understood by those with lower levels of education. Consideration should also be given to using videotapes as a safety training tool and translating training manuals into the language of the predominant ethnic group in the mine if English is not the first language of such workers.

Contractors

16.1 Because of the accident rate among high risk personnel such as diamond drillers and employees of mining contractors, new workers in these operations should receive safety training modelled on the Common Core before they begin their job and receive refresher courses at regular intervals.

16.2 While the Common Core, or key safety aspects of it will be made available to non–mining personnel who work underground, – e.g., tradespeople, construction workers, clerks, geologists, samplers, etc., such personnel should receive refresher courses in these basic safety and ground control skills.

First Aid

17.1 Pending the final determination concerning Regulation 950 under the Workers' Compensation Act, currently under review, companies engaged in diamond drilling should take immediate steps to ensure that all workers employed in these remote locations are trained in first aid and have their first aid certificate before being allowed to work in the camps.

17.2 Diamond drill companies should ensure that their workers are properly trained in radio communications between the main camps and sub camps before being employed in these remote locations. There should also be an improved system of communications between pilots and workers on the ground to assist diamond drillers when radio communication is impaired.

Alcohol and Drugs

18.1 Mining companies should ensure that mine supervisory personnel receive training in identification and intervention strategies associated with alcohol/drug abuse among employees. Employees should be trained about the nature of alcohol/drugs, particularly the risks associated with combining drugs and/or alcohol with a high–risk operation such as mining.

18.2 All mining companies should either have EAP, or, make this service available to their employees.

18.3 First Aid attendants at all mining operations, particularly isolated diamond drill sites should receive specialized training in understanding and identifying the problem of alcohol/chemical abuse.

18.4 Diamond drill companies should endeavor to provide enhanced recreational activities in remote diamond drill camps to alleviate the isolation and boredom.

Production Bonus

19.1 The tripartite Mining Fatalilties Committee should pursue their four initiatives designed to generate more conclusive evidence concerning the possible link between incentive bonus and accidents.

19.2 Following completion of the Laval Study, the findings should be reviewed by the tripartite Mining Fatalities Committee to determine if changes in the bonus system should be recommended to the provincial government.

Mining Research

20.1 Universities as well as industrial companies should be invited to bid on contract mining research involving safe production, and any impediments that exist should be removed.

20.2 The provincial government should encourage the NSERC to create a mining subcommittee to assist universities to achieve a higher level of funding for mining research related to safe production;

Ergonomics

21.1 Mining management should ensure that "human factors" are a primary consideration in the design and organization of work. Where possible, new mine equipment and safety apparel ordered by the company should be ergonomically designed. Existing equipment, tools and work processes deemed hazardous should be modified. Mining companies and governments at the federal and provincial levels should increase funding to universities to enhance ergonomic research which could be applied to the mining industry.

Occupational Illness/Disease

22.1 The government should could continue to study the occupational illness and disease concerns of miners with the assistance of competent professionals, in order to establish appropriate diagnostic and intervention strategies designed to prevent a recurrence of past problems.

FOOTNOTES

[1]G.W. Gibbs and P. Pintus, Health and Safety in the Canadian Mining Industry (Kingston, Ont.: Centre for Resource Studies, Queen's University 1978) p. 29.

[2]Ontario, Legislative Assembly, Standing Committee on Resources Development, Noranda Minerals Inc. (Geco Division), Submission to the Committee ([Toronto)]: Noranda Minerals Inc., [1988], p. 6.

[3]Briefing Notes – Mine Safety.

[4]Ontario, Legislative Assembly, Standing Committee on Resources Development, Safety in Ontario Mines, Submission to Committee (Toronto: Mining Health and Safety Branch, Ministry of Labour, 22 February 1988), p.28.

[5]Ibid., p. 27.

[6]Ontario, Legislative Assembly, Standing Committee on Resources Development, Briefing Notes – Mine Safety – MAPAO, Submission to Committee Inquiry into Mining Accidents and Fatalities (Toronto: Workers' Compensation Board, 25 January 1988 and update).

[7]Information on WCB Assessments for the seven mining rate groups was provided by the Occupational Health and Safety Educational Authority.

[8]Ontario, Legislative Assembly, Standing Committee on Resources Development, Ontario Mining Association, Submission to the Committee (Toronto: Ontario Mining Association, 28 January 1988), p.3.

[9]Briefing Notes – Mine Safety.

[10]Safety in Ontario Mines, p. 23.

[11]Marilyn Scales, "Accident Rate Slashed at Sudbury", Canadian Mining Journal 107:5 (May 1986).

[12]Correspondence from Workers' Compensation Board, 26 April 1988.

[13]Ontario, Legislative Assembly, Standing Committee on Resources Development, "Proceedings" (8 March 1988): R–22. On this date, Mr. Max Matte, a representative of the Canadian Diamond Drillers Association appeared before the Committee.

[14]Correspondence from Workers' Compensation Board.

[15]Joint Federal–Provincial Inquiry Commission into Safety in Mines and Mining Plants in Ontario, Towards Safe Production, Report, Vol. 2: Statistics and Research Reports ([Toronto: The Commission, 1981]), p. 180.

[16]Don Trotter and Jim Cluff, "Accident Investigation in the Ontario Mining Industry," paper presented to the Industrial Minerals Division at the 86th Annual General Meeting of the Canadian Institute of Mining and Metallurgy, Ottawa, 17 April 1984, p. 18.

[17]Ibid.

[18]R. Peter Riggin, "Whither Safety In Mining," paper delivered to the Annual General Meeting of the Canadian Institute of Mining and Metallurgy, Calgary, May 1981.

[19]Correspondence from Bruce Campbell, Ontario Mining Association, 14 March 1988.

[20]Safety in Ontario Mines, p. 32.

[21]Canada Centre for Mineral and Energy Technology, Mining Research Laboratories – Elliot Lake Laboratory ([Ottawa: Supply and Services Canada], n.d.).

[22]As the Committee's mandate was limited to traumatic accidents and fatalities, the Committee considered only Chapter 4 of the Ham Report which dealt with accidents/injuries. Ontario, Royal Commission on Health and Safety of Workers in Mines (James M. Ham, Commissioner), Report (Toronto: Ministry of the Attorney General, 1976).

[23]A.R.A. Consultants, A Report to the Occupational Health and Safety Education Authority, vol. 3: Occupational Health and Safety Education: Integration of Findings and Recommendations. ([Toronto: Ministry of Labour], 1987), p.103 – 110.

[24]Ontario, Legislative Assembly, Standing Committee on Resources Development, Submission of the United Steelworkers of America LU 4440 to the Standing Committee on Resource[s] Development Inquiry into Mining Accidents and Fatalities, (Timmins, Ont.: Local 4440, 1988).

[25]Canadian Business Task Force on Literacy, Measuring the Costs of Illiteracy in Canada, (n.p., 1988), p. 16.

[26]Occupational Health and Safety education, p. 103.

[27]Mining Accident Prevention Association of Ontario, Monthly Statistics: Injury Statistics, January–November 1987.

[28]British Columbia, Ministry of Health and Workers' Compensation Board, Task Force on Alcohol and Drug Abuse in the Workplace, (James M. Ryan, Chair), Report ([Victoria, B.C.]: The Task Force, 1987), p. 23.

[29]"B.C. to hold Workplace Substance Abuse," Canadian Occupational Health and Safety News, Vol. 10 No. 5, 9 February 1987.

[30]Joint Federal–Provincial Inquiry Commission into Safety in Mines and Mining Plants in Ontario, Towards Safe Production, vol. 1, p. 174.

[31]Ibid., p.178.

[32]"Ergonomics cuts costly accidents," Canadian Mining Journal 104:7 (July 1983).

[33]Ibid.

APPENDIX A

This appendix contains: a complete listing of all recommendations from three past Commissions of Inquiry (Ham/Burkett/Stevenson).*

- A summary of actions taken to date opposite each recommendation is included. This was prepared by the Mining Health and Safety Branch (MHSB).
- The response of the Standing Committee to the following 17 recommendations, which have not yet been acted upon, is also indicated with the relevant recommendations.

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* As the Committee's mandate was limited to traumatic accidents and fatalities, the Committee only considered Ham Recommendations 54 to 81 which dealt with accidents/injuries. However, the Committee considered the entire set of recommendations in the Burkett and Stevenson Reports.

RECOMMENDATIONS OF THE HAM COMMISSION

including:

- comments of the Mining Health and Safety Branch, Ministry of Labour;
- comments of the Standing Committee on Resources Development.

STATUS OF THE RECOMMENDATIONS OF THE ROYAL COMMISSION AS THE HEALTH & SAFETY OF WORKERS IN MINES (HAM COMMISSION) - JUNE 1980

January 1988

RECOMMENDATION	COMMENTS
GROUP A: POLICY FOR OCCUPATIONAL HEALTH & SAFETY	
The report contains four recommendations relating to the establishment of a health and safety authority and the legislative framework the authority should have.	Re: Recommendation 114 and 115 The intent of Recommendations 114, 115 and 116 has been incorporated in the Occupational Health and Safety Act, 1980, a comprehensive piece of legislation which applies to the work population of Ontario at large. Recommendation 117 was adopted by establishing the Occupational Health and Safety Division in the Ministry of Labour in December 1976.
114* That a Health and Safety in Mines and Mining Plants Act, separate from the Mining Act, be prepared to replace Part IX and the relevant sections of Part XI of the Mining Act and be administered within an Occupational Health and Safety Authority established in the Ministry of Labour (p. 254).	
115 That the Health and Safety in Mines and Plants Act consist of a core of general provisions supplemented by regulations the issuance of which is authorized by the Act (p. 254).	
116 That the general provisions of the Health and Safety in Mines and Plants Act identify the duties and responsibilities of the Mines Engineering and inspection Branch and the Occupational Health and Safety Branch (p. 254)	Re: Recommendation 116 Recommendation 116 requires the identification of the duties and responsibilities of the Branch. The OHSA, 1980 clearly defines the duties and responsibilities of the directors and the inspectors within the Occupational Health and Safety Division.
117 That an Occupational Health and Safety Authority, encompassing the Mines Engineering and Inspection Branch, the corresponding branches under the Industrial Safety Act and the Construction Safety Act, and the Occupational Health and Safety Branch, be established in the Ministry of Labour under an assistant deputy minister (p. 254).	

RECOMMENDATION	COMMENTS
GROUP B: POLICY GUIDELINES FOR THE INTERNAL RESPONSIBILITY SYSTEM	
B.1 Role of Labour and Management at the Industry-Level in the Development of a Regulatory Framework	
7 That the legal framework for the health and safety of workers in mines continue to recognize the importance of a significant component of collective self-regulation by industry as a whole achieved through a Mines Health and Safety Association (p. 46).	Re: Recommendation 7 The Mines Accident Prevention Association of Ontario (MAPAO) is the body that provides collective self-regulation by the industry. MAPAO is constituted under Section 119 of the Worker's Compensation Act, and funds for its operation are collected by the Worker's Compensation Board. The MAPAO provides a wide range of services to its members including: the education of supervisors through the Neil George 5-point system, the conducting of ventilation surveys, carrying out safety audits of companies, the publication of accident and employment statistics for the mining industry for class 5 employees, which represent about two-thirds of the mining population. The MAPAO provides detailed material on their specific activities and accomplishments.
72 That the task groups set up by the Occupational Health and Safety Authority to advise on codes of practice and statutory regulations relating to technological change in mining include representatives of labour (p. 163)	The Mining Act Review Committee was established by Order-In-Council in 1975 before the Ham report was issued. It is a tripartite committee made up of industry, labour and government representatives. The government representatives were non-voting members of the committee. This committee is now called the Mining Legislative Review Committee. It meets regularly and provides advice to the Minister of Labour on the regulation of Ontario mines.

RECOMMENDATIONS

Accidents and Injuries: Review and Definition of Internal Responsibility at the Workplace--Procedures and Policy

55 That management inform the Joint Health and Safety Committee about its policies on rehabilitative work assignment and in the context of independent medical consultation seek the advice of the Committee in giving wise effect to its policies. (p. 121).

59 That the senior management of each mining operation review the performance of its internal-responsibility system, placing special emphasis on the delineation of 1/ responsibility to detect and to report departures from standard conditions at every level of operations, 2/ location of responsibility for ensuring that identified departures are dealt with, 3/procedures for committing the resources to correct anomalies, and 4/ procedures for checking the action already taken and still to be taken. (p. 152)

70 That each mining company provide its employees with a written statement outlining its policy for health and safety and the organizational arrangements and responsibilities for giving effect to it (p. 160).

Re: Recommendations 55, 59 & 70

These recommendations are addressed to the management of mining companies. Their implementation is dependent upon the extent to which senior management is committed to them. Section 14 of the OHSA, 1980 outlines the employer's duties with respect to the workplace, working procedures and equipment. Section 14(2)(a) requires an employer to "provide information, instruction and supervision to a worker to protect the health or safety of the worker". Section 16(2)(b) requires a supervisor to "provide a worker with written instructions as to the measures and procedures to be taken for protection of the worker".

Recommendation 59 suggests that management develop a monitoring program to assess the effectiveness of the internal responsibility system and to determine the corrective action that may be required. The duties and responsibilities of the Joint Health and Safety Committees as outlined in the OHSA, 1980 are sufficiently broad to permit the fulfillment of this recommendation.

RECOMMENDATION	COMMENTS
B.3 Accidents and Injuries: Work Auditors - Their Responsibilities and Procedures	Re: Recommendation 60, 61, 63, 64 and 65
60 That statutory provision be made for the appointment in each mine and plant of worker-auditors having the authority an responsibility to examine and report upon conditions of work pertaining to the health and safety of workers at sets of workplaces designated by management in such a way as to encompass all workplaces in underground, open pit, reduction plant, and shop and surface operations (p. 153)	The worker-auditor concept has been incorporated in the OHSA, 1980 in section 8(8). It requires "The members of a committee who represent workers ... (to) ... designate one of the members representing workers inspect the physical condition of the work place, not more often than once a month or at such intervals as a Director may direct." Section 8(8) also says that "it is the duty of the employer and the workers to afford ... (the designated worker) ... such information and assistance as may be required for the purpose of carrying out the inspection." The effectiveness of this provision is being carefully monitored by the Mining Health and Safety Branch of the Ministry.
61 That worker-auditors be given released time with regular wages while performing their duties (p. 154)	In addition to the above, several companies and their unions have negotiated and set up worker inspectors. These worker inspectors complement the safety programs by investigating accidents and making inspections much the same as the representatives of the joint health and safety committee.
63 That worker-auditors be appointed from among qualified candidates for a period of three years through the collective bargaining unit, where such exists, or be elected by the workers (p. 115)	1988 Response of Standing Committee on Resources Development: Recommendation 60 The Standing Committee on Resources Development supports the statutory provision of worker safety representatives. (See Recommendation 7.1, Report on Mining Accidents and Fatalities.)
64 That there be statutory provision for the appropriate worker-auditor to participate in the investigation of fatal accidents and serious injuries (p. 156)	
65 That the designated worker-auditor have the privilege of cross-examining witness at an inquest into any fatal accident whose circumstances he has participated in investigating (p. 156)	The provisions of recommendation 65 are not contained in the legislation. Under the Coroner's Act, at the discretion of the Coroner, any person can be declared a person in standing at an inquest, and thus have the right to question witnesses.

RECOMMENDATION	COMMENTS
8.4 Accidents and Injuries: Joint Health and Safety Committees - Establishment and Procedures	Re: Recommendations 66, 67, 68, 69 and 55
66 That there be statutory provision for the establishment of a Joint Labour-Management Health and Safety Committee at each mine and plant (p. 157)	The legislation fully meets the recommendations of the Report. Indeed, the provisions of the OHSA, 1980 with respect to the Joint Health and Safety Committees go beyond the report. Section 8 of the Act stipulates the requirements for the composition, powers and responsibilities of the Joint Health and Safety Committees. In addition, it requires that the members of the committees be paid appropriately for time spent carrying out their duties.
67 That the membership of the Committee consist of equal numbers of persons appointed by management and appointed by members of the collective bargaining unit(s), where such exist, and otherwise elected by the workers collectively, subject to the constraint that at least two of the persons selected be worker-auditors (p. 157)	
68 That the Joint Committee conduct its work as far as feasible during regular hours of work and that its members receive their regular wages while engaged on committee work (p. 157)	
69 That the Joint Committee meet regularly at least four times per year and not more than once monthly (p. 158)	
55 That management inform the Joint Health and Safety Committee about its policies on rehabilitative work assignment and in the context of independent medical consultation seek the advice of the Committee in giving wise effect to its policies. (p. 121)	

RECOMMENDATION

8.5 Accidents and Injuries: Examination of Work Conditions and Equipment Deemed Unsafe

79 That section 169(16)(b) be amended (and be included in a revised Act, to be recommended) to require the supervisor to make a written report which: 1/ states the nature of the condition of the machine or device which in the worker's belief renders it unsafe for use; 2/ gives the supervisor's comments at the time; and 3/ gives the supervisor's confirmation or otherwise that section 169(15) is, in the supervisor's view, satisfied (p. 176)

80 That the worker who refers a machine or device to his supervisor under section 169(16)(b) as amended sign and receive a copy of the supervisor's report (p. 177)

81 That where a worker after due consultation with his immediate supervisor, believes that the work then assigned cannot be performed by standard procedures without encountering personal risks deemed by him to be unreasonable, there be a statutory requirement that the work situation be examined and judged by a member of senior supervision in the presence of a worker-auditor acting as an observer and that a report of the circumstances be made to the mines inspectorate by the manager (p. 178)

COMMENTS

Re: Recommendations 79, 80 and 81

The OHSA, 1980, Section 23 and 24, details the procedures for the examination and determination of work conditions believed to be unsafe, and also details the procedures for investigation of the circumstances by the supervisor and the inspector. Although the Ham Report did not recommend that a statutory right to refuse to perform unsafe work be established, the Act does provide the right and provides for final adjudication of disputed claims involving the exercise of that right. The legislation is quite specific as to the procedures to be followed when a worker believes an unsafe condition exists (See Section 23, particularly subsection (3) to (1) inclusive).

Section 16(2)(b) requires that written instructions regarding measures and procedures to protect the work and the work place be provided where prescribed.

RECOMMENDATION

GROUP C: STUDIES AND RESEARCH

C.1 Silicosis and Dust

REVIEW OF HEALTH STATUS OF EXPOSED WORKERS

1 That the Occupational Health and Safety Branch of the province conduct or have conducted and publish on a regular cycle not exceeding five years status reports on the evolution of occupational diseases among miners (p. 32).

COMMENTS

General Observation

Since the Ham Report was published, the Federal Parliament has assumed jurisdiction over occupational health and safety in uranium mines and plants, and the review of the health status of uranium mines has become a federal responsibility. The Worker's Compensation Board has statutory responsibility for studies and activities pertaining to compensability and rehabilitation efforts.

Re: Recommendation 1

The first report of this type was published in 1975 and dealt almost entirely with respiratory disease. A study of the evolution of occupational diseases among miners is being done by the Ministry and the Worker's Compensation Board. See also comment on Recommendation 17 below.

1982	Muir study commences, due for completion in 1988
1983	Part I - "Study of Mortality of Ontario Miners 1955-1977" released by Dr. Jan Muller.
1986	Part II released
1986	Silicosis study of surface workers released, Special Studies by Dr. Finklestein

	RECOMMENDATION	COMMENTS
2	That the radiological status of silicosis in the dust-exposed population currently employed in the Elliot Lake uranium mines and all other uranium mines be reviewed by the Occupational Health and Safety Branch on a biennial basis for a period of at least ten years (p. 33)	Re: Recommendation 2 Dust exposed uranium miners are examined on a regular basis by the Ministry's Chest Clinic. Results of these examinations are reported to the Workmen's Compensation Board with special attention being given to those who show early signs of dust effects or more advanced X-ray changes which may be classified as silicosis. The WCB can therefore, at any time, indicate the number of current employees whose X-rays reveal dust effects. 1987 Dr. Muller: Addendum to Mortality Study dealing solely with uranium mining in the province 1955 - 1977 To be released publicly in near future.
3	That the radiological status of silicosis among the persons on record on the Uranium Nominal Roll be reviewed on a biennial basis for a period of at least ten years (p. 33)	Re: Recommendation 3 This recommendation has not yet been implemented. Workers whose X-rays exhibit signs of silicosis may not necessarily have any respiratory disability, but they may submit claims to the WCB, nevertheless. Those who submit claims are entitled to periodic reviews of their situation. Routine follow-ups of miners who show no evidence of dust-related disease at the time of leaving employment have not yet been implemented.
28	That the Occupational Health and Safety Branch commission research on the radiographic records related to Miner's Certificates to assess the relative rate of progression of persons in and out of dust (p. 59)	Re: Recommendation 28 This has been carried out as part of the Ontario Miners Study. The records of miners who develop silicosis were reviewed with particular reference to the sequential changes in their X-rays. From these studies information was obtained about the relative rate of progression of the condition in persons in and out of dust.

RECOMMENDATION

C.2 Silicosis and Dust: Studies of Environmental Conditions, and Research for the Establishment of Standards

17 That to provide a basis for establishing a statutory standard or standards for time-weighted average respirable dust exposure in Ontario mines and plants, the Occupational Health and Safety Branch commission epidemiological research on the relation of the incidence of silicosis and of other pulmonary effects to the structure and quantity of aerosols respired in Ontario mines (p. 53)

COMMENTS

Re: Recommendation 17

The Ministry in conjunction with the mining companies has provided financial support to Dr. David Muir of McMaster University to conduct a study of this project. The report is due in mid-1988. It is hoped that sufficient data will be available to allow a correlation of exposure records with the observed X-ray evidence. Ontario has a collection of thousands of X-rays of dust-exposed miners. Dr. Muir, with the assistance of a group of experts, has re-read approximately five thousand X-rays and re-classified them in accordance with current international diagnostic criteria. The objective will be to determine whether there is a differential rate of progression of disease dependent on the quantity of aerosol to which the miners are exposed.

	RECOMMENDATION
18	That where more than one recognized toxic component is present in the aerosols the standard specify how an effective combined exposure limit is to be determined (p. 53)

COMMENTS

Re: Recommendation 18

O/Reg 654/86 (1986) Exposures to Biological or Chemical Agents has "mixture formula" included. However, the hazardous substances must have similar toxilogical effects (i.e. effect the same target organ(s)), and must affect the individual over a similar time period. In practical terms, therefore, combined exposure limits are rarely used.

The International Commission on Radiological Protection does combine the effects of all radionuclides (alpha, beta, gamma, from dusts, gases) and sets a maximum annual exposure limit of 50 mSv, which has been adopted by the AECB.

O/Reg 654/86 resulted in changes to the mining regulations to adopt the 1986-1987 ACGIH TLV booklet for those chemical and physical agents not covered by 654/86.

Ian French & Associates were retained by CANMET to develop an air quality index for diesel fumes. This formula is not practical to use on a day-to-day basis but it is used by CANMET in assessing alternate diesel control strategies.

RECOMMENDATION

6 That the Occupational Health and Safety Authority publish at least biennially a critical review of its appraisal of environmental conditions at the workplaces in the mines and mineral plants (p. 43)

COMMENTS

Re: Recommendation 6

This has not been done. This report would be useful, only if it showed the trends of the environmental conditions at each mining plant or mine. A report showing this data by type of ore mined, or geographical area would not really be helpful in targeting those mines with poor workplace environment.

All data, MH&SB, companies and MAPAO should be placed on a common data base, using internationally recognized job codes and classes. This data base could then be used to check trends among drillers, or equipment operators, as well as between mines with similar mining conditions. If required, a biennial report could be produced.

Presently the MH&SB is placing all its radon & thoron daughter results on a data base to analyze trends and/or problems in all the non-uranium mines. Similar data bases will be developed for silica and other airborne contaminants.

RECOMMENDATION	COMMENTS
C.3 Lung Cancer and Ionizing Radiation: AECB Radiation Measurements and Effects, Research, and Provincial Occupational Health Records Review	
31 That the Atomic Energy Control Board confirm the extent to which thoron gas and its daughter products contribute to the irradiation of the respiratory system and other organs of workers in Ontario uranium mines (p. 68)	Re: Recommendation 31 & 37 The AECB currently regulates thoron daughters to 12 WLM/yr maximum. If found in the presence of radon daughters and gamma radiation then the allowable exposure will be considerably less. The sum of adsorbed dose from all forms of radionuclides cannot exceed 59 mSv/yr. 1986 O/Reg. 632/86 designated X-rays as a controlled substance. Presently the Ministry is developing a regulation for radionuclides not covered under AECB jurisdiction. In addition, regulations are being developed for radon daughters in underground operations.
37 That the Atomic Energy Control Board 1/ have research conducted relevant to current circumstances a/ on means for measuring all components of ionizing radiation effective in contributing significantly to the irradiation of the lungs, other organs, and tissues of workers in Ontario uranium and thorium mines and mills; and b/ on the spatial and temporal distribution of ionizing radiation and related particulates in these mines and mills; 3/ facilitate, with the assistance of the federal Department of Health and Welfare, epidemiological research on a national basis (p. 86)	Re: Recommendation 37 AECB has commissioned several research projects.

RECOMMENDATION	COMMENTS
39 That the Occupational Health and Safety Branch be assigned by provincial statute the responsibility to direct: 1/ the establishment and review of occupational health records for workers in uranium and thorium mines and mills, for regulatory and epidemiological purposes;	Re: Recommendation 39 AECB requires all uranium mining companies to maintain records of a worker's exposure to radon daughters and gamma radiation. As well, companies must monitor for thoron daughters, uranium and other radionuclide dusts. In the non-uranium mines the Ministry is presently developing regulations for radon daughters which will include record keeping.

RECOMMENDATION

COMMENTS

C.4 Lung Cancer and Ionizing Radiation: Epidemiological Studies on Causes and Effects of Irradiation and Mortality Experience

33 That the Occupational Health and Safety Branch commission a review of the mortality experience of persons on the Ontario Uranium Nominal Roll on a biennial basis for at least ten years (p. 80)

43 That the Occupational Health and Safety Branch commission a study of the mortality experience of the Ontario Uranium Nominal Roll relative to appropriately matched sample populations of non-uranium miners and non-miners in Ontario (p. 91)

44 That the Occupational Health and Safety Authority of the province, in collaboration with the Atomic Energy Control Board, have conducted further epidemiological research based on the exposure to ionizing radiation among Ontario uranium miners (p. 96)

45 That the epidemiological research include a study of 1/ the amount and type of exposure effective in raising cancer mortality, 2/ the pathology of lung cancer in miners, and 3/ the effects of cigarette smoking and of other conjoint occupational factors (p. 96)

Re: Recommendations 33, 43, 44 and 45

Recommendations 33, 43, 44 and 45 are covered by Dr. Muller's. Dr Muir's and Dr. Finklestein's respective studies, as described under the comments on Recommendations #1 and 17.

In Dr. Muller's study the cohort covered the years 1955 to 1977. Discussions are taking place regarding the extension of this study to include the 10 years from 1977 to 1987.

52 That tests using sputum cytology be conducted every two years on all persons who have worked in radiation exposure at the uranium mines for five or more years (p. 108)

Re: Recommendation 52

Apparently, the risk of infection from the procedure has resulted in an arrangement where it is available to workers on a voluntary basis.

RECOMMENDATION

C.5 Accidents and Injuries: Studies of Accident and Injury Risk Factors and the Reporting Procedures

57 That the Occupational Health and Safety Branch publish biennially a critical review of factors that influence risks of accident and injury at workplaces in the mines and mineral plants (p. 130)

58 That the Occupational Health and Safety Authority, in consultation with the Worker's Compensation Board, industry and labour, review the procedures for the reporting of injuries and accidents with a view to establishing links to occupational records and thereby facilitating accident research by sample methods (p. 145)

78 That all fatalities and serious injuries to persons working along underground be the subject of biennial review by the Occupational Health and Safety Branch (p. 175)

COMMENTS

Re: Recommendations 57 & 58

A statistical report of mining accidents is prepared by th Ministry on an annual basis. The MAPAO publishes injur statistics on all mining companies on a monthly basis, with eac company's frequency for lost time and medical aid injuries. Ther are breakdowns on type of work, age, time of day, etc., and thes are analyzed to determine whether there are any links. Injurie to persons working alone are also assessed.

Re: Recommendation 78

All mining fatalities and serious accidents are fully investigate by the Mining Health and Safety Branch. The legislativ requirement for reporting accidents is contained in Section 25 o the OHSA, 1980, and in Section 20 of Ontario Regulation, 714/82 The "working alone" fatalities are investigated in the same manne as the other fatalities, but they have not yet been subjected t the biennial review as described in the recommendation.

1988 Response of Standing Committee on Resources Development: Recommendation 78

The Standing Committee on Resources Development concurs with this recommendation that directs the MHSB to undertake a biennial review of all "working alone" fatalities and serious accidents. The Committee urges the MHSB to follow up. (See Committee's Recommendation 13.1, Report on Mining Accidents and Fatalities.)

RECOMMENDATION

C.6 Toxic Substances: Studies of Hazardous Exposure Patterns and Effects

90 That profiles of risk-encounter for toxic substances be developed by examining the work patterns of maintenance workers, and that modular training be adapted to such profiles (p. 206)

93 That at five-year intervals the Occupational Health and Safety Branch commission a review of the status of the health of samples of persons who are at high risk from acute encounters with toxic substances, including as necessary intensive medical surveillance (p. 207)

94 That epidemiological reviews of selected populations subject to chronic exposure to toxic substances in reduction plants and mines matched to suitable control groups be conducted on a five-year cycle by or under the guidance of the Occupational Health and Safety Branch and that the essential results of such studies be summarized and published upon completion (p. 212)

COMMENTS

Re: Recommendations 90, 93 and 94

Training modules have been developed by the Branch covering subjects such as hazardous materials, maintenance practices, concentrators, smelters and refineries. These modules describe potential hazards and the means for overcoming them.

Regulation 694 section 259(b) requires records to be kept of injuries from chemical reagents.

The Ministry has produced a series of Designated Substance Regulations. An open consultative process was used during the development of the regulations including a study of the available information on health effects and typical exposures. Regulations now exist for substances such as lead, mercury, arsenic and silica.

RECOMMENDATION

C.7 Noise: Studies of Noise Levels and Effects on Exposed Workers

104 That the mining industry, in cooperation with labour and the Occupational Health and Safety Authority, have conducted research to determine shift-profiles of noise encounter for representative occupations in mines and plants both in the absence and in the presence of actual and best-available hearing protection, that such profiles be codified and published, and that a code be assigned to each worker who regularly encounters areas of work in which noise levels of 85 dB(A) or higher exist (p. 230)

108 The Occupational Health and Safety Branch commission on a five-year cycle statistical assessments of the state of hearing among sample populations of workers in mines, and that the first review be of production crews in underground operations, including diesel operators (p. 232)

COMMENTS

Re: Recommendations 104 & 108

Noise surveys have been carried out by the Branch as well as by various mining companies.

Also, specific studies into noise have been made by CANMET and by Ontario Hydro on selected groups of workers. Considerable published information is available on noise and the effectiveness of various types of hearing protection.

The Branch has adopted 85 dBA over 8 hours as the standard. However, there does not appear to be any practical method of control other than by hearing protection and audiometric testing of workers. These measures are the responsibility of the employers. The mining industry in general has effective hearing conservation programs in place.

RECOMMENDATION	COMMENTS
SECTION D: STANDARDS, GUIDELINES AND CODES OF PRACTICE	
D.1 Silicosis and Dust: The Establishment of Interim TLV's and Future Standards for Free-Silica Dust Levels	
11 That the Occupational Health and Safety Authority establish by regulation a dust standard for personal exposure to free silica in mine and plant aerosols based on a time-weighted average of respirable dust intensity over a working shift and a stipulated lifetime period of exposure (p. 50)	Re: Recommendations 11, 12, 13 and 15 These have been legislated under the Designated Substance Regulations for Silica (O/Reg 769/83)
12 That the dust standard for time-weighted average exposure be established on a statutory basis (p. 50)	
13 That the Occupational Health and Safety Authority immediately establish by regulation an interim threshold limit value (TLV) for the mass of respirable free silica in milligrams per cubic metre (p 51)	
14 That the interim TLV have the status accorded by the Occupational Health and Safety Authority to threshold limit values as issued by the American Conference of Governmental Industrial Hygienists (p. 51)	Re: Recommendation 14 The TLV has been set at 0.2 mg/m^3 maximum, with a view to achieving 0.1 mg/m^3.
15 That the Occupational Health and Safety Branch prepare a code of requirements for the gravimetric measurement of dust in all mines suited to determining personal exposure to dust (p. 51)	

RECOMMENDATION	COMMENTS
16 That all steps necessary to render effective a gravimetric standard of dust measurement, including those listed herein, be implemented immediately (p. 51)	Re: Recommendation 16 The Code for Measuring Airborne Silica, which includes the analytical method for the determination of cristobalite and alpha quartz on air sampling filters, dated October 17, 1983, came into force with the passage of the designation of silica, December 9, 1983.

RECOMMENDATION

D.2 Lung Cancer and Ionizing Radiation: Review & Development of AECB Regulatory Framework

34 That the Atomic Energy Control Board review the basis for and issue explicit regulations establishing the maximum permissible annual exposure to ionizing radiation for workers in uranium and thorium mines and mills (p. 86)

35 That the regulations for maximum permissible exposure delineate how all significant components of external and internal irradiation are to be accounted for and indicate how total exposure and related dose is to be evaluated (p. 86)

36 That the regulations for maximum permissible exposure and related dose to be interpreted in units that can be monitored by practical means in uranium and thorium mines and mills (p. 86)

37 That the Atomic Energy Control Board 2/ issue codes of guidance a/ for the frequency and location of sampling required to determine both the radiation exposure of individual workers in Ontario mines and mills and the general state of the mine and mill environment; b/ for the selection, use, maintenance, and calibration of instruments for measuring ionizing radiation both for the determination of individual exposures and for the monitoring of the general mine and mill environment; c/ for the identification of persons for whom records of radiation exposure should be kept; and d/ for the form, preservation, and use of occupational records for exposure to all significant components of ionizing radiation;

COMMENTS

These recommendations are addressed to the AECB, which has jurisdiction over radiation in uranium mining. The province is represented on an advisory committee which considers these problems.

Re: Recommendations 34, 35 and 36

Schedule 11 of Section 19 of the Atomic Energy Control Regulations, issued on January 12, 1978, limits the exposure of atomic radiation workers to radon daughters to 4 WLM (Working Level Months) per year and to 2 WLM per quarter. This section also specifies the maximum allowable exposure to ionizing radiation at 50 mSμ/yr, based on ICRP.

Re: Recommendation 37

In Section 11 of the Atomic Energy Control Regulations, licenses are required to keep records which allow a worker's radiation exposure to be determined. Each mine develops a code of practice which is approved by the AECB.

RECOMMENDATION

D.3 Lung Cancer and Ionizing Radiation: Development of Ontario Regulatory Framework

38 That the Province of Ontario, through the Occupational Health and Safety Authority, establish by statute a standard for maximum permissible annual exposure to ionizing radiation for workers in uranium and thorium mines and mills, and that this standard be in conformity with the regulatory standards of the Atomic Energy Control Board (p. 87)

40 That the Mines Inspection Branch prepare regulations defining the kinds and frequencies of measurements of ventilation, dust and radiation necessary to enable it to audit the engineering operational characteristics of uranium and thorium mines and mills (p. 88)

41 That these regulations be in conformity with the related code of guidance established by the Atomic Energy Control Board (p. 88)

42 That the Occupational Health and Safety Authority specify 1/ a level of radiation in mine or mill air measured at any time in any occupied workplace which, if exceeded, requires that corrective action be taken immediately; 2/ a level of radiation in mine or mill air measured at any time in any occupied workplace which, if exceeded, requires closure of the related workplace until the level of radiation is reduced below that specified in 1 (p. 88)

COMMENTS

Re: Recommendation 38, 40, 41, 42

The province has no authority to deal with the measurement or control of exposure to ionizing radiation in uranium mines. Such matters are the responsibility of the Atomic Energy Control Board.

The Ministry is developing a regulation to cover those radionuclides which are not presently under the jurisdiction of the AECB.

RECOMMENDATION

D.5 **Noise and Toxic Substances: Development of a Regulatory Framework for the Control of Noise and Toxic Substances**

110 That the Occupational Health and Safety Authority be assigned by statute the responsibility to establish standards or guidelines for personal exposure to all toxic substances and hazardous physical agents and that, subject to any statutory standards and in consultation with industry and labour, the Authority issue a code of practice for the application in mines and plants of the Threshold Limit Values of the American Conference of Governmental Industrial Hygienists (p. 235)

COMMENTS

Re: Recommendation 110

Section 41(14) of the OHSA, 1980, provides statutory authority for the Ministry of Labour to declare certain substances as designated substances and to regulate their use. Further, Section 20(1) provides authority for the Director of the Mining Health and Safety Branch to control the use of toxic substances which have not been designated under Section 41(14).

Substances which have been legislated as Designated Substances follows:

Date	O/Reg	Substance
1981	536/81	Lead
1982	141/82	Mercury
	516/82	Vinyl Chloride
	517/82	Coke Oven Emissions
	570/82	Asbestos
1983	769/83	Silica
	455/83	Isocyanates
1984	733/84	Acrylonitrile
	732/84	Benzene
1986	654/85	Asbestos - Construction Projects
	176/86	Arsenic
	632/86	X-Rays
	654/86	Biological & Chemical Agents (TLV's)
1987	146/87	Ethylene Oxide
	23/87	All DSR's amended 40 hrs/week and 8 hours day

RECOMMENDATION

E.1 Silicosis and Dust: Measurement of and Reporting on Environmental Monitoring

4 That the functional purpose, measuring procedures, and measured results relating to all environmental monitoring at the workplace be made known in understandable language to all affected workers and their representatives by the employer and as appropriate by the Mine Inspection Branch (p. 40)

5 That the Mines Inspection Branch within the Occupational Health and Safety Authority conduct annually, or have conducted by an independent agency, sample measurements at representative workplaces of all environmental quantities whose values are audited by the branch in carrying out its role (p. 43)

19 That the existing code of requirements for dust measurement in the uranium mines as issued by the chief engineer of the Mines Engineering Branch remain in force (p. 53)

COMMENTS

Re: Recommendation 4

All these points are addressed in the Designated Substance Regulations on Silica (O/Reg 769/83).

Re: Recommendation 5

The Designated Substance Regulations place this responsibility on the companies. Normally problem areas/substances are monitored more frequently to determine worker exposures and evaluate effectiveness of controls.

The Branch does not have the resources to conduct routine mine-wide sampling. However, the Ministry does take measurements in problem areas and audits the results of company sampling.

Re: Recommendation 19

This recommendation has been rendered obsolete by the Silica Regulations.

RECOMMENDATION	COMMENTS
20 That the system of measurement and reporting being conducted by the Mines Accident Prevention Association continue in operation and be subject to independent monitoring as recommended (p. 54)	Re: Recommendation 20 The Mining Health and Safety Branch does not audit the konimetry measurements conducted by the Mines Accident Prevention Association of Ontario as this technique has been superceded by the gravimetric sampling technique, and is now used only for purposes of monitoring the effectiveness of engineering controls. The MAPAO is endeavouring to have the companies continue a system of measurement and reporting, modified to apply to gravimetric techniques. This is considered most important for the continued success in the control of silicosis. As described previously, the silica regulation requires mines to carry out work place monitoring.

RECOMMENDATION	COMMENTS
E.2 Silicosis and Dust: Codes and Schemes of Practice for Dust-Control and Ventilation	Re: Recommendation 8
8 That the Mines Inspection Branch within the Occupational Health and Safety Authority, in consultation with industry and the representatives of workers, prepare, under clearly defined statutory authority, CODES OF PRACTICE applicable to all mines relating to: 1/ the prevention and confinement of dust at each distinctive class of workplace; 2/ the provision of ventilation in the breathing zone of workers that is effective for purposes of protecting health and each distinctive class of workplace (including vehicles) (p. 49)	The Ministry of Labour has adopted a policy regarding codes of practice. Regulations specify performance criteria: the focus is on what is to be accomplished. The way in which the required result is achieved is the responsibility of the employer. However, the Act does permit the establishment of codes of practice by regulation. Specific codes of practice are contained in Ontario Regulation 660/79 (sections 242, 243, 244, 245, 247, 248, 255, 256 and 282). In addition, the Threshold Limit Values (TLV) for Chemical Substances and Physical Agents of the American Conference of Governmental Hygienists (ACGIH) are adopted as guides.
9 That the management of each mining operation or appropriate part thereof be required under clearly defined statutory authority to prepare and keep updated A SCHEME OF PRACTICE for implementing the foregoing codes (p. 49)	Section 14 of the Act requires the employer to provide "measures and procedures" for the worker where prescribed and Section 16 requires supervisors to ensure that these practices are used.
10 That the management be required to appoint a competent person to supervise the over-all operation of the scheme (p. 49)	The Act requires that supervisors be "competent", (See Sections 14(1)(c), 14(2)(b), 14(2)(c), 14(3) and 16.)

RECOMMENDATION	COMMENTS
E.3 Lung Cancer and Ionizing Radiation: Monitoring and Auditing Radiation Levels and Ventilation Systems	
32 That the Occupational Health and Safety Authority be given by statute the authority and responsibility to conduct a full and expeditious review of any emergent situation in which the health and safety of workers in mines are believed to be at unexpected risk (p. 78)	Re: Recommendation 32 The inspector is provided with wide and effective powers under Section 28 and 29 of the OHSA, 1980 to deal with any situation which may place the health and safety of workers at risk. The director is given additional authority with respect to toxic substances in Section 20, and under the Designated Substance Regulations.
39 That the Occupational Health and Safety Branch be assigned by provincial statute the responsibility to direct: 2) the preparation of a code of practice for the sampling and measurement of ionizing radiation in a manner suited to the determination of the exposures of individual workers in uranium and thorium mines and mills and that this code of practice be in conformity with the code of guidance issued by the Atomic Energy Control Board (p. 87)	Re: Recommendation 39 Exposure to ionizing radiation is dealt with in Regulation 19 pursuant to the Atomic Energy Control Act. Since the jurisdiction is exclusively federal, the province has no authority to implement this recommendation. The Ministry is developing a regulation to cover those radionuclides which are not presently under the jurisdiction of the AECB.
46 That persons who work in exposure to ionizing radiation in uranium mines cease smoking both at home and at work for their own sakes and in consideration of their families (p. 96)	Re: Recommendation 46 This recommendation relates to the Federal Regulation and is therefore not within the jurisdiction of the provinces. However, smoking is prohibited by company rules in uranium mines.

RECOMMENDATION	COMMENTS
47 That each uranium mine install a central monitoring system for its ventilation network to monitor air flow and air quality as indicated by dust, radiation, and other contaminants (p. 102)	Re: Recommendation 47 Air monitoring systems have been installed at both Rio Algom and Denison Mines, but problems have been found due to unreliability in the harsh underground conditions. Also, similar systems have been installed at other mines, though similar problems have hindered widespread use of this technology.
48 That the Mines Inspection Branch audit the engineering records of performance of mine ventilation systems (p. 102)	Re: Recommendation 48 Ventilation audits are done by inspectors on their routine inspections. Section 243(2) of O/Reg 660/80, requires that detailed records be kept of the mine ventilation system performance, for review by an inspector.

RECOMMENDATION	COMMENTS
E.4 Silicosis, Dust, Lung Cancer and Ionizing Radiation: Job Rotation and Record Maintenance	
23 That any employer who rotates job assignments for workmen with the intent of limiting the occupational exposure of any persons to any hazardous environmental condition be required to obtain the formal approval of the Occupational Health and Safety Branch and to maintain permanent occupational records which clearly define the persons, tasks, locations, hazardous conditions, and time intervals involves (p. 57)	Re: Recommendation 23 The general requirement for keeping records of workers' exposure to hazardous substances is contained in Section 15(1)(d) of the OHSA, 1980. Job rotation is permitted to control a workers' exposure where engineering controls are not practical.
49 That job rotation within mines conducted to meet the standard for maximum permissible annual exposure to ionizing radiation be permitted only in exceptional circumstances with the explicit approval on a case-by-case basis of the Occupational Health and Safety Branch and with the knowledge of the representatives of the workers (p. 105)	Re: Recommendation 49 Action levels, and the annual and quarterly maximum exposure levels, stipulated by the Atomic Energy Control Board as conditions of licence are designed to control exposure levels.
50 That records of personal exposure to ionizing radiation maintained by the miens be keyed to Miner's Certificate numbers in sequence and to social insurance numbers in sequence and arranged in a format that facilitates linking to the Mining Master File (p. 107)	Re: Recommendation 50 The Mining Master File no longer exists, but has been replaced and up-dated by a more sophisticated computerized record of exposure information on Ontario miners. The Miner's Certificate Number and the Social Insurance Number, when known, are added. Records are maintained by the uranium mines and sent to Radiation Protection Branch, Ottawa.

RECOMMENDATION

51 That the frequency of regular radiographic examination of dust-exposed mine workers be reduced to once every two years unless a radiographic change was apparent at the last examination (p. 107)

Re: Recommendation 51

When silica became a designated substance in 1983 (O/Reg 769/83), the requirements for mandatory dust exposures certificates and X-rays for miners were revoked. Only those mines exposed to concentrations of silica exceeding 0.1 mg/m^3 are on a control program of medical monitoring. Many miners have no requirement for regular medical monitoring. Those mines on medical surveillance are examined every two years.

RECOMMENDATION

E.5 Accidents & Injuries: Pattern of Audits

56 That the Mines Inspection Branch base its patterns of audits in part on studies of the relative risks involved in different segments of mining operations and on the related man-years at risk (p. 128)

COMMENTS

Re: Recommendation 56

Current practice in the Branch now includes a monthly analysis of a company profile, produced by the computerized data record, and a listing of the mining operations and mining companies with the 10 highest accident rates. Problem mines are inspected more frequently.

RECOMMENDATION

E.6 Accidents and Injuries: Qualifications and Visitation of Persons Working Alone

74 That persons assigned to work alone be required to have specified qualifications for independent work at the job to which they are assigned (p. 174)

75 That on all shifts persons working alone be visited at the place of work at least three times (other than at the start of a shift) by a first-line supervisor (p. 174)

76 That such visits may be reduced to once per shift (other than at the start of a shift) if 1/ work conditions are standard, and 2/ means of communication are provided and a record of use thereof is kept so that the person working alone reports his status to a point of supervision or to a designated fellow worker not less often than once every two hours (p. 174)

77 That where the location of work is sufficiently remote to warrant the use of technical means of communication and where no illumination other than that of the miner's cap lamp is normally available, an auxiliary source of illumination powered by means other than the miner's lamp battery be provided at the workplace (p. 175)

COMMENTS

Re: Recommendation 74, 75, 76 and 77

These recommendations are addressed in Section 14 of the OHSA, 1980, in general, and by Sections 15 and 252(b) of the Ontario Regulation 660/80 in particular. These recommendations are regarded as standard practice in underground mines and are fully complied with.

In addition, two recent amendments to the Regulations apply, namely, O/Reg 258/87, Section 62a. re: communications and Section 65a., re: underground lighting.

RECOMMENDATION	COMMENTS
E.7 Toxic and Hazardous Substances: Audit of Metallurgical and Other Hazardous Substances	
82 That there be a statutory requirement for a metallurgical audit of origin, holdup, and destination of potentially dangerous minor elements such as lead, mercury, arsenic, selenium, tellurium, cadmium, and antimony to be conducted quarterly in all reduction plants on the basis of extended standard monthly sampling and analytical procedures, and that a copy of this audit be sent to the Occupational Health and Safety Authority (p. 200)	Re: Recommendations 82 and 83 The problems addressed by these recommendations are addressed by Section 20 of the OHSA, 1980 and by Section 257, 258 and 259 of O/Reg. 660/80. Also by OSR O/Reg 654/86 on Chemical and Biological Agents.
83 That there be a statutory requirement for an annual audit of use by mass of toxic and hazardous reagents and that a copy be sent to the Occupational Health and Safety Authority (p. 200)	
84 That pilot plant studies used to develop processes and preliminary operating procedures be extended to an impact on the health and safety of the environment for work (p. 200)	Re: Recommendation 84 See Section 5 of O/Reg. 660/80. The pre-development review procedures applied to new process technology are intended to be broad enough that the intent of the recommendation is fulfilled.

RECOMMENDATION	COMMENTS
E.8 Toxic and Hazardous Substances: Codes and Schemes of Practice for the Use and Control of Chemicals and Toxic Substances	
85 That there be a statutory requirement for each mining company to maintain a register of servicing chemicals involved in any personal encounter associated with a medical aid or compensable injury; that the register specify both trade name and chemical composition and identify all known toxic chemical constituents; that the register include an audit by mass of annual use; and that a copy of this register be provided to the Occupational Health and Safety Authority (p. 204)	Re: Recommendation 85 Recommendation 85 is provided for by Section 15(1) of the OHSA 1978, and by Section 259 (record keeping), Section 260 (reporting) and Section 281 (labelling) of O/Reg 660/80. The provincial and federal governments are putting in regulations on Work place Hazardous Material Information Systems (WHMIS) in 1988 to further address the sale and use of hazardous substances.
86 That there be a statutory requirement for each mining company to give the Occupational Health and Safety Authority notice of intent to introduce any new reagent or servicing chemical whose toxic characteristics are not known (p. 204)	Re: Recommendation 86 Recommendation 86 is provided for in Section 15(1)(e) and Section 21(1) of the OHSA, 1978.
87 That with respect to codes of practice the principles of recommendations 8, 9 and 10 be extended 1/ to the maintenance and operation of mills and metallurgical plants as these activities relate to the leaking and spilling of toxic substances and hot materials into workplaces; 2/ to the handling and use of reagents and servicing chemicals and to the consequences of their leaks and spills (p. 204)	Re: Recommendation 87 This recommendation is intended to deal with molten materials. Section 91 of Ontario Regulation 660/79 responds to it. Sections 257, 258 and 259, together with the various Designated Substance Regulations cover other materials.

RECOMMENDATION	COMMENTS
E.9 Toxic and Hazardous Substances: Monitoring and Recording of Hazardous Exposure	
91 That at any location of regular work where acute encounters with toxic substances repeatedly occur as a result of leaking, recirculating, or spilling from metallurgical and milling processes, there be a statutory requirement for the installation and use of equipment for the continuous monitoring of the substances involved (p. 206)	Re: Recommendation 91 There is no statutory requirement for continuous monitoring of hazardous substances. However, under Section 20(1) of the OHSA, 1978, the Director has the power to order work practices, engineering controls, etc. with respect to toxic substances. Section 15(1)(f) places a duty to monitor on the employer. Several employers have installed continuous monitoring systems for particularly toxic substances such as nickel carbonyl, chlorine and arsine. In addition, Section 242(3) requires that detection equipment shall be available.
92 That a record of the substances and human effects of acute encounters with toxic substances leading to medical aid and compensable injuries be maintained in the occupational health records of each worker at the company level (p. 207)	Re: Recommendation 92 The recommendation places a responsibility on the company management. The OHSA 1980 and Ontario Regulation 660/80 go beyond the recommendation by requiring record-keeping with respect to toxic substances. Section 259 and 260 of the Regulation and the Designated Substance Regulations address many toxic substances.

RECOMMENDATION	COMMENTS
E.10 Diesel Emissions: Codes of Requirements and Practice for Diesel Emissions Control and Ventilation	
100 That the Occupational Health and Safety Authority, in cooperation with the industry and labour, prepare a code of requirements for diesel emissions (p. 222)	Re: Recommendation 100 The TLV's of the ACGIH which have been adopted through Section 279 of Ontario Regulation 654/86 and O.R. 654/86 on Biological and Chemical Agents cover, inter alia, diesel emissions. See also Sections 175, 176 and 243, of the same regulation, governing the ventilation rates to be used underground, where diesel equipment is in use.
101 That the Mines Inspection Branch prepare a code of practice for the provision of ventilation and for the fuelling, operation and maintenance of diesel engines (p. 222) 102 That each mine using diesel equipment be required to file with the Mines Inspection Branch a scheme of practice for the short-term and long-term maintenance of its diesel engines (p. 222)	Re: Recommendations 101 and 102 The codes of practice required under recommendation 101 and 102 are provided for in Sections 114, 115, 175 and 177 of Ontario Regulation 694/80, which cover maintenance, the service and fuelling stations, the keeping of log books and schemes of practice and ventilation.

RECOMMENDATION	COMMENTS
E.11 Noise: Monitoring and Control of Noise Levels and Codes of Practice	
103 That each mining operation maintain noise maps based on full-scale conditions of operation which delineate all areas of work at which the noise level is 85 dB(A) or higher (p. 229	Re: Recommendation 103 Noise maps are not a practical solution. In surface plants, whole sections of buildings are designated as hearing protection areas and are posted as such, rather than post individual areas. Underground, certain types of work are designated as requiring hearing protection for everyone in the vicinity, since areas are continuously changing.
106 That the Occupational Health and Safety Authority issue a code of practice for the selection and use of personal hearing protection and for communicating in the presence of noise (p. 231)	Re: Recommendation 106 This has been addressed as CSA Standard #Z94.2 - M1984.
107 That, by statute, each mining company be made responsible for maintaining effective audiometric records for each employee who in the absence of hearing protection regularly encounters noise at levels of 85 dB(A) or higher, and that such audiometric records be required to be keyed 1/ to social insurance numbers, 2/ to Miner's Certificate numbers where such have been assigned and 3/ to a code number of noise-profile-encounter as previously recommended (p. 232)	Re: Recommendation 107 The Designated Substance Regulation for noise is about to be legislated. In the meantime, most mining companies maintain effective audiometric records for each employee in order to control costs of worker's compensation. The level of 85 dB(A) has been legislated through the adoption of the ACGIH values for TLV's (O. Reg. 654/86, Section 279)
109 That the Occupational Health and Safety Branch regularly inspect all audiometric testing facilities not under the supervision of a designated medical specialist, and that any designated medical specialist be required to certify biennially in writing that the facilities under his supervision conform to the minimum standards of the Branch as then current (p. 233)	Re: Recommendation 109 The Ministry carries out these duties under the supervision of medical specialists.

RECOMMENDATION	COMMENTS
Group F - Rehabilitation and Compensation Programs	
F.1 Silicosis and Dust: Work Adjustment and Income Maintenance	
21 That the current employees in the Elliot Lake uranium mines who are silicotics or exhibit dust effects (radiographic 4) in their lungs be eligible for a voluntary programme of work adjustment; that this programme be supported by management and unions; and that the Worker's Compensation Board provide rehabilitative compensation and supportive counselling services to assist the persons involved (p. 57)	Re: Recommendation 21 An assistance program supported by Management and Labour is already in effect for uranium mines in Elliot Lake.
22 That Section 53 of the Worker's Compensation Act be amended as necessary to provide clear entitlement for rehabilitative compensation based on the principle of work adjustment for persons subject to exceptional exposure to environmental hazards at work (p. 57)	Re: Recommendation 22 The programme is already in effect. The provisions of Section 53 of the WCB Act will be clarified when the Act is next reviewed. The December 1979 changes in the Act pertained to the amounts of various benefits payable.
24 That during a programme of personal rehabilitation through work adjustment, and for a minimum period of two years thereafter, the income of the worker be maintained in accordance with the provisions of the Worker's Compensation Act for full compensation which allow the Board to pay in non-taxable compensation 75 per cent of the difference between the current rate of pay and the rate of pay applicable at the date of entry into the programme (p. 58)	Re: Recommendation 24 Under the WCB's program, benefits are not limited to two years, but are payable throughout the period of wage loss.

RECOMMENDATION	COMMENTS
25 That in addition to wage maintenance, the worker in a work adjustment programme be eligible for rehabilitation training allowances as provided for in the Worker's Compensation Act (p. 58)	Re: Recommendation 25 The recommended provisions are already in effect and included in the existing programme. The Mining Health and Safety Branch is supporting and cooperating where appropriate. The Branch audits records and assists the WCB in investigating the claims. The Mining Health and Safety Branch provides the WCB with any available exposure record data for the individual.

RECOMMENDATION

F.2 Silicosis and Dust: Eligibility for Counselling Costs and Work Adjustment

26 That, further, the worker be entitled to reasonable costs for medical and personal counselling beyond that provided by the Workmen's Compensation Board, and to reasonable moving, travelling, and related relocation costs when these are applicable (p. 58)

27 That when the lungs of a worker exhibit dust effects and the worker seeks the opportunity through work adjustment to take employment with a new employer, the new employer not be held liable for any disability pension or other costs for silicosis or disease conditions related thereto that may be levied as a consequence of the person becoming a silicotic at a future date (p. 59)

29 That persons on the Uranium Nominal Roll who exhibit dust effects (radiographic 4) within twenty years of entry into Ontario dust exposure, and who have been employed in dust exposure in the uranium mines for a cumulative interval of five or more years from 1954 to 1975 inclusive, be eligible for rehabilitation assistance under a programme of work adjustment (p. 60)

Re: Recommendations 26 and 27

The recommended provisions are already in effect, and are included in the existing programme.

Re: Recommendation 29

The present assistance program was designed to encourage currently affected miners to leave exposure employment. Those who have already left the mining industry for other employment have made their adjustment, and the assistance program would not be necessary.

Should silicosis subsequently be diagnosed in a miner who has left the industry, this would be reported to the Board, and entitlement to the full range of benefits considered. The existing program is broader than the recommendation.

RECOMMENDATION	COMMENTS
30 That where there is evidence that the exposure of any person to silica-laden dust has been substantially in excess of established dust guidelines or standards and the person has exhibited dust effects in his or her lungs within twenty years of first exposure to dust in Ontario, the person be eligible for work adjustment rehabilitation assistance (p. 60)	Re: Recommendation 30 This is provided in the program already in effect. The Mining Health and Safety Branch assists the WCB in investigating the claimant's work and exposure history.

RECOMMENDATION	COMMENTS
F.3 Lung Cancer and Ionizing Radiation: Identification of and Compensation to Families of Deceased Workers	
53 That the Workmen's Compensation Board of Ontario, in collaboration with other provincial boards as provided for in interprovincial agreements, seek out and advise the families of all ascertained deaths due to lung cancer on the Nominal Roll that a claim for compensation should be entered (p. 109)	Re: Recommendation 53 This has been done by the WCB.

RECOMMENDATION

F.4 Accidents and Injuries: Reporting of Injury Statistics

54 That the Workmen's Compensation Board require and make provision for the inclusion in non-fatal injuries in which the injured person fails to return to his or her regular job on the day following the date of the accident giving rise to the injury (p. 121)

1988 Response of Standing Committee on Resources Development: Recommendation 54

The Committee learned from the WCB that the concerns raised during the Ham Commission "related to reporting practices on first aid and health care claims and the subsequent effect on recurrence entitlement and accident statistics." The WCB does not favour a requirement that first aid injuries be reported to the Board, due to the additional administrative burden. It would also require an amendment to the Workers' Compensation Act.

While the Committee realizes that reporting first aid injuries would create an additional workload for the Board, the Committee nevertheless believes that first aid statistics should be reported to the Board. Since employers are already required to keep a record of first aids, making this practice a statutory requirement should not be viewed as onerous.

COMMENTS

Re: Recommendation 54

The recommendation refers to non-uniform standards i recording of injury statistics in the mining industry due t light duty injuries which are not reported to the Board.

Section 117 of the Worker's Compensation Act stipulates employers have to notify the Board in writing of all acc which disable the employee from earning full wages or necessitate medical aid.

The existing provisions of the Act do not require an emplo report to the Board "first aid only" injuries, and therefo statistics for such injuries cannot be compiled by the Board

Although it is conceivable that in some "first aid only" cases, the worker might be temporarily assigned to other th regular work, the number of such cases is considered relatively insignificant, because as soon as either medical compensation for lost time beyond the day of acciden involved, the accident would have to be reported to the Boa would enter the Board's statistics.

A requirement that "first aid only" injuries be reported t Board would necessitate an amendment to the Act, and, consi the additional administrative work involved to comply with requirement, the Board is not in favour of recommending su amendment.

RECOMMENDATION	COMMENTS
F.5 Toxic and Hazardous Substances: Eligibility for Compensation of Workers Exposed to Sulphur Dioxide	
99 That workers in reduction plants who have been exposed for twenty years or longer to sulphur dioxide at levels approaching the current Threshold Limit Value and to associated dust and fumes, and who exhibit the clinical diagnosis of chronic bronchitis and impaired pulmonary function as identified by objective tests, be considered for compensation at up to a maximum of 20 percent disability (p. 219)	Re: Recommendation 99 Subsequent to the 1978 mid-year Status Report, the original Ministry of Health studies were further analyzed in conjunction with a very limited amount of new data appearing in the world medical literature on the subject of Chronic Obstructive Lung Disease (C.O.L.D.) in persons exposed to nickel aerosols. As a result of these further studies, the data were documented and guidelines for the adjudication of claims for Chronic Obstructive Lung Disease in Smelter workers relating to sulphur dioxide and particulate exposure were developed, presented and approved by the Board on September 19, 1979. The Board is now in a position to accept those claims where the criteria are met. Due to the multi-casual nature of this disease, partial liability has been determined at levels between 20% and 40% which is more generous than the original recommendation of 20% made by the Commission in its report. A copy of the guidelines in question is attached as Exhibit 1.

RECOMMENDATION	COMMENTS
GROUP G. INSTITUTIONAL AND ORGANIZATIONAL INITIATIVES	
G.1 Training and Qualification: Qualification of Professionals and Accreditation of Workers	
71 That the core of the staff of the Mines Inspection branch continue to be based on persons of exceptional professional experience in mining, and related fields of engineering, supplemented by special training in occupational health and safety and in the principles of the administration of work (p. 163)	Re: Recommendation 71 The staff of the Mining Health and Safety Branch continues to consist of persons with excellent professional experience in mining. The Mining Health and Safety Branch sends its inspectors on courses relating to both administration and occupational health and safety.
73 That the industry, government, and labour give high priority to the development, standardization and accreditation of modular training and qualification for workers in mines and plants (p. 169)	Re: Recommendation 73 Modular training is required by Section 10 of the Ontario Regulation 569/83. The Ministry of Skills Development has established an extensive modular-training program for miners in most of the mining companies at this time. Accreditation is given for the basic training and certification for the 38 specialty skills. In addition, there is a program for first-line production supervisors in underground hard rock mines.

RECOMMENDATION

C.2 Research and Training in Occupational Health: University Programs of Research and Teaching of Professionals

88 That engineering schools review and redefine their responsibility to the profession to ensure that graduates are more keenly aware of an responsive to the impact of technological design upon the occupational health and safety of workers (p. 205)

COMMENTS

Re: Recommendation 88

Provincial Lottery funds have been provided through the Ministry of Labour to fund the development of four Occupational Health and Safety Resource Centres in the Province. One of their responsibilities is to encourage and assist engineering schools to provide their students with relevant OH&S knowledge. The Resource Centres are located at Queen's, Western, Waterloo and Lakehead Universities.

The Ministry of Northern Development and Mines commissioned a study, chaired by Mr. C.B. Ross, to examine the future needs of mining schools in Ontario. The report of this study was completed in 1987. A National Forum on Rock Mechanics Education is scheduled for May 1988, as a result of a recommendation of the Provincial inquiry into Ground Control and Emergency Preparedness in Ontario Mines.

RECOMMENDATION	COMMENTS
89 That resources for joint research and teaching by specialists in occupational health and safety in faculties of medicine and engineering be given high priority by both the universities and government (p. 205)	Re: Recommendation 89 Through the Provincial Lottery, the Ministry of Labour has funded joint program development in occupational health and safety at McMaster University and the University of Toronto. Besides cooperation between the two universities, this program also involves collaboration between the Faculties of Preventative Medicine and Engineering at U of T. The bulk of the program is post-graduate leading to degrees or diplomas such as M.Eng., D.I.H., M.H.Sc. Occupational Health and Safety material is also part of under-graduate courses. Subsequent to the Provincial Inquiry into Ground Control & Emergency Preparedness in Ontario Mines, the Province has established two chairs in mining research at Queen's University and Laurentian University. The Ministry of Labour is part of joint research programs with the Canadian and US governments involved in Diesel Emission studies and Ground Control. Direct funding of a study into the development of improved respirators has been provided to Laurentian University. Cooperative research with the Federal government and the mining industry has been undertaken for Rockburst Research ($4.2 million) and into Backfill Technology and Mine Design ($3.5 million) through a Canada-Ontario Mineral Development Agreement. Further to another recommendation of the Stevenson Inquiry, a Mining Research Directorate has been established in Sudbury, under a tripartite Board of Governors to undertake cooperative mining research programs.

RECOMMENDATION	COMMENTS
G.3 WCB Agreement and Levies: Funding of Worker-Auditors and Joint Health and Safety Committees' Research Programs	
62 That the Workmen's Compensation Act be amended to make provision for the assessment of the costs of worker-auditors upon employers in class 5 (p. 154)	Re: Recommendation 62 The selection of a worker-auditor is provided for in Section 8(8) of the Act. (See discussion of Recommendations 60 to 65. Group B.3). Section 8(12) of the Act stipulates that the worker selected as a member of the joint committee must be paid at his regular or premium rate as appropriate. To date there has been no indication from the companies that there is a need for funding to cover the costs of such workers on a collective basis, through the WCB, or otherwise.
113 That under the Workmen's Compensation Act provision be made for the levying on all employers in class 5 an amount of 0.03 per cent of wages currently subject to levy under the Act to create a fund for research on occupational health and safety by the joint labour-management health and safety committees (p. 239)	Re: Recommendation 113 This recommendation has not been implemented because funds for research projects have been made available from lottery funds, Ministry of Labour funds and WCB funds.

RECOMMENDATION

G.4 Medical Programs: Industry-Level Medical Consultation Services

111 That the mining industry establish for its employees, where such is not now provided, occupational health surveillance by a supervising medical director or consultant experienced in occupational medicine (p. 237)

112 That the labour unions individually or in consort appoint to their staff a consulting specialist in occupational medicine (p. 237)

COMMENTS

Re: Recommendation 111

Medical surveillance is an integral component of the Designated Substance REgulations. Most employers, accordingly, have physicians responsible for medical surveillance. In addition the Ministry's physicians are available to assist employers set up a medical surveillance program and advise their colleagues on occupational medicine.

Unions have access to and use specialists in occupational medicine to advise them as well as carry out independent studies.

STATUS OF THE RECOMMENDATIONS OF THE ROYAL COMMISSION
ON THE HEALTH AND SAFETY OF WORKERS IN MINES (HAM COMMISSION)
as of January 1988

INTRODUCTION

To discuss the implementation of the recommendations made by Dr. Ham, the recommendations have been categorized into 7 groups.

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GROUP	SUBJECT	RECOMMENDATIONS
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GROUP	SUBJECT	RECOMMENDATIONS
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	.2 Silicosis & Dust	26, 27, 29, 30
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RECOMMENDATIONS OF THE BURKETT COMMISSION

including:

- comments of the Mining Health and Safety Branch, Ministry of Labour;
- comments of the Standing Committee on Resources Development.

STATUS OF THE RECOMMENDATIONS OF THE JOINT FEDERAL-PROVINCIAL INQUIRY COMMISSION INTO SAFETY IN MINES AND MINING PLANTS IN ONTARIO - (THE BURKETT REPORT, APRIL 1981) January 1988

RECOMMENDATION	COMMENTS
CHIEF EXECUTIVE OFFICER	
1. That the chief executive officer of each mining company operating in Ontario review his personal commitment and contribution to the safety performance of his organization with a view to exercising his authority and leadership in the manner outlined.	Re: Recommendation 1 There is no doubt that the personal commitment of the CEO of a company is essential to the performance of safety in that company. Most companies have a written safety policy and performance objectives to ensure that supervisory staff will aim to achieve those objectives.
2. That where the Mining Health and Safety Branch identifies an operation as sub-standard, the district engineer meet with the manager of the operation to review performance and to advise of the branch's response; and further, that the branch so notify the chief executive officer by registered letter.	Re: Recommendations 2 and 3 Where an operation is judged sub-standard, Branch Inspectors meet with the Mine Manager and corrective action is taken. Where the corrective action has called for an extensive programme which needs to be scheduled, over a period of time, the meeting takes place with management and the health and safety committee. This type of meeting has been convened by the inspectors and a staff engineer, or the Director, depending on the severity of the situation. In some cases, it has been necessary to involve the Chief Executive Officer.
3. That where the Mining Health and Safety Branch identifies a company as having sub-standard performance, the Director of the Mining Health and Safety Branch meet with the chief executive officer of the company to review performance and to advise of the Branch's response.	

RECOMMENDATION	COMMENTS
4. That the Mining Health and Safety Branch review the cost indicator models being developed by the United States Bureau of Mines for metal mines and assess their applicability to Ontario mining operations. Using these cost indicator models or some modification thereof, the costs of accidents to each mining company (by operation) be computed on an annual basis.	Re: Recommendations 4 and 5 It would appear that the cost indicator models being prepared b the U.S. Bureau of Mines have been postponed due to constraints The Branch feels that we should prepare our own cost indicato models especially for the serious and severe accidents that hav occurred recently. A more sophisticated information system has t be organized (WCB style) to collect and analyze the data.
5. That a company operating a mine or mining plant in Ontario include in its annual report a comprehensive statement of safety performance including relevant comparative data and a statement of costs incurred.	1988 Response of Standing Committee on Resources Development: Recommendation 4 The Standing Committee on Resources Development concurs with the MHSB that the branch should develop its own cost indicator models.
6. That a workmen's compensation merit rating scheme, tailored specifically to the mining industry, be introduced.	Re: Recommendation 6 The MAPAO publishes injury statistics on all mining companies on monthly basis, with each company's frequency for lost time an medical aid injuries. These statistics are available for everyon in the industry and are, in effect, a merit rating scheme.
7. That the Mines Accident Prevention Association of Ontario carry out independent safety audits and that each mining company operating in Ontario consent to having the MAPAO perform an annual safety audit.	Re: Recommendation 7 The MAPAO have been carrying out safety audits under th International Safety Rating System (ISRS) at most companies in th province. These have been high successful in some of the large companies with dramatic reduction in lost time injuries. Th audits are less applicable to smaller, less sophisticate operations, and have had to be modified accordingly.

RECOMMENDATION

8. That the individual companies be ranked on the basis of the audit results and that the ranking be made public by the MAPAO.

COMMENTS

Re: Recommendation 8

To be effective, the ISRS needs to be fully accepted by company, and companies are not willing to accept being rank the basis of audit results. Since it is only one tool several which can be used to improve safety, this recommend has not been enacted. However, the audit results are gene shared with the joint health and safety committee and plannin improvement should be a joint exercise.

1988 Response of Standing Committee on Resources Development: Recommendation

The Standing Committee on Resources Development concurs with t recommendation concerning the public ranking of mining companies based on audit results of the International Safety Rating System, and urges the min safety association to follow up.

RECOMMENDATION

FIRST LINE SUPERVISORS

9. That a committee be struck, with representative of the mining companies, the unions representing workers in mines and mining plants and the government for the purpose of developing a modular training program for first line supervisors in both underground and surface operations and that individuals be certified by the company conducting the program as competent to supervise in a mine or mining plant upon successful completion.

10. That from the date the program commences only persons who have such certification be appointed to fill regular first-line supervisory positions.

11. That persons occupying first-line supervisory positions as of the date the program commences, be required to complete the program and become certified within a reasonable time period stipulated by the tripartite committee.

COMMENTS

Re: Recommendation 9

A modular training program for first line production supervisors has been developed jointly by labour and management and the Ministry of Skills Development and was enacted into legislation in June 1987 by an amendment to Section 10 of Ontario Regulation 694.

Re: Recommendation 10 and 11

Section 10(2) of Ontario Regulation 694 requires that an underground worker who commences employment after June 1987, is required to be trained in the Basic Common Core Program, during the first year of employment. Likewise, a newly appointed underground production supervisor will be expected to be trained in the Common Core for First Line Production Supervisors, in order to qualify as a competent person, as required in Section 14 of the Act.

RECOMMENDATION

12. That the number of first-line underground supervisors employed by each mining company be sufficient to allow for at least two workplace contacts with each crew per shift and that the time alloted for these visits be sufficient to allow for adequate assistance and instruction to inexperienced crews and crews working in difficult areas.

13. That wherever practical, a minimum of two group leaders for each first line underground supervisor be appointed.

14. That individual work crews be more involved in the planning of their work and, in conjunction with group leaders, be made responsible for achieving short-term production targets.

15. That first-line supervisors assume an enlarged role as facilitatory, resource persons and safety auditors.

COMMENTS

Re: Recommendation 12

Traditionally, the number of first line underground supervisors is designed to allow for two visits to each workplace on each shift, allowing sufficient time for individual contacts including assistance and instructions. However, some companies are changing the traditional concepts, as described in 15 below.

Re: Recommendation 13

The appointment of stope bosses and drift leaders have been standard practice in mines for many years. Also see 14 and 15 below.

Re: Recommendation 14

It is agreed that individual work crews should be involved in the planning of their work. Some mines are experimenting with the team concept, where first line supervisors are replaced by team leaders.

Re: Recommendation 15

In mines where the team concept is being used, the first line supervisors become co-ordinators or facilitators, who are responsible to plan the work, co-ordinate movement of supplies and equipment and to look after training. In other mines the role of the supervisor is mostly that of a resource person, planner and safety auditor, and to ensure that workers have significant involvement in the planning of their work.

RECOMMENDATION

16. That the ministry adopt an even-handed and consistent practice with respect to prosecutions and make known to the industry that it will not seek to prosecute a first-line supervisor or any other employee unless satisfied that he or she has failed to take every precaution reasonable in the circumstances of has otherwise clearly acted negligently in complying with the Act and regulations.

COMMENTS

Re: Recommendation 16

The Mining Branch observes the criteria set out in the Ministry of Labour prosecutions policy. No person will be prosecuted unless he or she had failed to take every precaution reasonable in the circumstances or has otherwise clearly acted negligently in complying with the Act and regulations.

RECOMMENDATION

THE WORKER

17. That each worker review his commitment to safe work practices and undertake to work in a safe manner at all times and to assume the full range of his responsibilities as a member of the direct internal responsibility system.

COMMENTS

Re: Recommendation 17

It is management's responsibility to ensure that the worker understands his responsibilities as a member of the direct internal responsibility system. Each worker should then be prepared to review his commitment to safety and undertake to work in a safe manner at all times.

RECOMMENDATION

JOINT HEALTH AND SAFETY COMMITTEE

18. That provision be made in law for a full-time worker safety representative in each mine or mining plant employing more than 500 workers, and that where the number of workers in any mine or mining plant is less than 500, provisions be made for the appointment of a worker safety representative to spend a proportionate amount of work time engaged in safety related activities.

19. That a worker safety representative hold office for a two-year term and work closely with the company's safety department.

20. That a worker safety representative be a member of the joint health and safety committee otherwise qualified to serve in this position.

21. That a worker safety representative not be permitted to hold any union office or to engage in partisan union political activity of any kind.

22. That a worker safety representative be paid the full amount he would have been paid had he continued in his classification.

23. That a worker safety representative report all workplace anomalies to first-line supervision and to the safety department and that only in the event that the condition is not corrected to the satisfaction of the worker safety representative within a reasonable period of time should the matter be taken up with the joint health and safety committee.

COMMENTS

Re: Recommendations 18 to 24 Inclusive

There has been considerable discussion on the subject of full-time worker safety representatives by the Mining Legislative Review Committee. All are agreed on the principle of worker involvement but there are differences in opinion on how to achieve this, and on their responsibilities and affiliations. Worker safety representatives are in place at most of the larger mining companies, having been negotiated through the respective collective bargaining agreements. They seem to be working out quite well.

Of the mines employing more than 500 workers, the majority have worker safety representatives.

RECOMMENDATION

24. That the existing provisions of the Act which allows the minister to grant exemptions also apply to the election or appointment of worker safety representatives.

25. That membership on joint health and safety committees be restricted to workers not holding other union positions and to line supervisors or managers, and that workers acting as committee members not be permitted to engage in partisan union political activities.

26. That joint training for members of joint health and safety committees be undertaken and, where possible, supervisors also be involved.

27. That, in the absence of agreement to the contrary, the costs of such programs be charged back to the company or union on per participant basis.

28. That the allocation of government monies to health and safety training be on condition that joint training be carried out wherever possible.

1988 Response of Standing Committee on Resources Development: Recommendation 26

The Standing Committee on Resources Development concurs with this recommendation advocating joint training of health and safety committee members. (See Report on Mining Accidents and Fatalities, Recommendation 6.1.)

COMMENTS

1988 Response of Standing Committee on Resources Development: Recommendation 25

The Standing Committee on Resources Development disagrees with this recommendation restricting workers on joint health and safety committees from holding union positions, and believes it should not be implemented.

Re: Recommendation 25

The unions strongly reject the recommendation that membership o Joint health and safety committees be restricted to workers no holding other union positions. Although in theory th recommendation appears to have merit, there are good practica reasons why it cannot be applied, such as the availability o workers willing to fill the positions.

Re: Recommendation 26

It is generally agreed that joint training should be carried ou on a continuous basis with supervisors totally involved. Thi occurs with worker and supervisor trainees taking the common cor programme together in some mines.

Re: Recommendation 27

The costs of such programmes have always been assumed by th company employing the students.

Re: Recommendation 28

The only government monies which are allocated to health an safety training are provided by the WCB to the Safety Association and to the Ontario Workers Occupational Health and Safety Healt Centre. The Safety Associations provide various services to th industry, including training programs, some of which are join training and others which are specifically for management o workers. Likewise, the OWOSH Centre provides training, mostly t workers but on request also to supervisors.

RECOMMENDATION

29. That the chief executive officer and management of each mining company ensure that the joint health and safety committee is consulted on the full range of safety issues and that the documentation, data, materials and other information necessary for this purpose be made available to it.

30. That the joint health and safety committee monitor the use of discipline as a tool in the achievement of safety recommendations.

31. That at least one of the worker members of the joint health and safety committee (preferably the full time worker representative) be given sufficient time to prepare the worker portion of the committee agendas and to investigate and inquire into the matters which are before the committee.

32. That the worker members of the joint health and safety committee be provided with a private office (which may also double as the worker safety representative's office) equipped with adequate furniture and supplies and that typing and reproduction services be made available by the company.

COMMENTS

Re: Recommendation 29

The joint health and safety committee provides a forum for communication and resolving work place concerns in a cooperative fashion. The Ministry inspectors check that the committees are functioning properly and are provided with means to do so.

Re: Recommendation 30

In discussing this recommendation, the Burkett report assumes it to be concomitant with Recommendation #25, which has proven to be impractical. However, there is no reason why this should inhibit the committee from making recommendations as to the use of discipline both generally and in individual cases.

Re: Recommendation 31

Both the companies and the unions agree that one worker member of the health and safety committee be given sufficient time to prepare the worker portion of the committee agenda.

Re: Recommendation 32

It should be possible in the case of large operations to provide an office for worker safety representative or the health and safety committee members, however it could be difficult in smaller operations and may not be necessary.

1988 Response of Standing Committee on Resources Development: Recommendation 30

The Standing Committee on Resources Development concurs with the above comments of the MHSB concerning the Joint Health and Safety Committee's monitoring of discipline as a tool in achieving safety.

RECOMMENDATION	COMMENTS
THE SAFETY DEPARTMENT	Re: Recommendations 33 and 34
33. That in addition to assisting the line organization, the safety department within each company be made responsible for auditing the safety performance of the line organization.	In most companies the Safety Department is responsible for auditing the safety performance of the line organization and has direct reporting access to the Mine Manager. The reporting relationship should be direct to the person in charge of the total operation.
34. That the manager of the safety department have direct reporting access to senior executives responsible for the line organization including the chief executive officer.	
35. That first-line supervisor receive the requisite training and carry out workplace safety inspections as part of a planned program of rotation of first-line supervisors through the safety department.	Re: Recommendation 35 Many companies endeavour to rotate first-line supervisors through the Safety Department to improve their knowledge and contribution to the safety programme.
36. That each local union representing workers in Ontario mines and mining plants review its approach to health and safety matters and take the steps necessary to commit itself to a course of union-management cooperation in health and safety administration.	Re: Recommendation 36 The unions feel that each local has committed itself to a course of union/management cooperation and continues to do so.
37. That each parent labour body actively encourage and support union-management cooperation in health and safety matters at the local level and cooperate with the industry in those health and safety endeavours which require the direct involvement of the parent body.	Re: Recommendation 37 The unions feel that the parent body has actively encouraged and supported union/management cooperation. They feel that the recommendations should be changed to read that each labour body continue to actively encourage, etc.

RECOMMENDATION

MINES ACCIDENT PREVENTION ASSOCIATION OF ONTARIO

38. That the Mines Accident Prevention Association of Ontario sever its ties with the Ontario Mining Association, retain the services of a full-time executive director, establish its own offices, make provision for its own support staff and services, and continue to be financed by levies against its member companies.

39. That the Mines Accident Prevention Association of Ontario establish labour-management advisory committees at both the provincial and regional levels and that it move to include representatives of labour and the public on its board of directors.

COMMENTS

Re: Recommendation 38

This has been done.

Re: Recommendation 39

The Mines Accident Prevention Association has made some efforts to have some labour participation in its technical standing committees and on its Board of Directors. However, the unions were never satisfied with the limitations stipulated by the MAPAO, and following a misunderstanding, withdrew their representatives. The MAPAO maintain that they are still seeking labour participation. In the meantime, the Educational Health and Safety Education Authority of the WCB, has funded the Ontario Workers Occupational Safety and Health Centre in Toronto, together with five branch offices. The purpose of this organization is to provide training to workers, particularly in health and safety. Amongst others they train members of Health and Safety Committees to recognize hazards in the work place, and they train workers to be trainers of their peers. They have been invited by at least one major company to train supervisors at the same time.

1988 Response of Standing Committee on Resources Development: Recommendation 39

The Committee concurs with the thrust of this recommendation supporting the participation of labour/public on the board of directors of the mining safety association. For a fuller discussion see Standing Committee on Resources Development: Report on Mining Accidents and Fatalities, Recommendation 8.1.

RECOMMENDATION

MINING HEALTH AND SAFETY BRANCH

40. That the Mining Health and Safety Branch advise the industry and its workers in writing of its policies and practices with respect to the enforcement of the Act and regulations and apprise the industry and its workers of any changes to its policies and practices or the adoption of any new enforcement initiatives.

41. That the branch inspector meet with a worker representative and employe representative before commencing a workplace inspection and that these representatives be required to identify, in the manner described, all unresolved health and safety concerns.

42. That the branch inspector meet with these worker and employer representatives after the workplace inspection to review their previously identified concerns in light of the results of the inspection.

43. That the branch inspector review, in the presence of the representatives, the minutes of the health and safety committee meetings which have occurred since the previous inspection.

44. That following each inspection, the branch inspector be required to file with his supervisor a written report on the performance of the internal responsibility systems at the particular operation.

COMMENTS

Re: Recommendation 40

The Mining Health and Safety Branch advises industry and workers of its policies and practices by meeting with various groups and discussing enforcement. It also distributes information in writing to targeted groups. In addition there is the tripartite program consisting of 39 audio visual modules describing the performance objectives of the Act and regulations, which was prepared jointly by the Branch, industry and labour, and which is available to all.

Re: Recommendations 41, 42 and 43

Copies of health and safety committee minutes have been sent to the Mining Branch offices for many years. The Branch inspectors discuss any concerns that the worker representative may have, prior to the commencement of the inspection. In some cases these concerns become the focus of the inspection.

1988 Response of Standing Committee on Resources Development: Recommendation 44

The Standing Committee on Resources Development would take the audit of IRS a step further. See Report on Mining Accidents and Fatalities, Recommendation 9.2.

Re: Recommendation 44

Branch inspectors discuss problems with the Internal Responsibility System with their supervisors following inspections at these operations. Various reports such as assessment reports, orders, accident reports, Joint Health and Safety Committee minutes, etc., form the basis for auditing IRS.

RECOMMENDATION

45. That branch inspectors be given the training necessary to carry out these responsibilities.

46. That the Mining Health and Safety Branch develop the capability of responding to relationship difficulties that are impeding health and safety performance.

47. That the future recruitment of branch inspectors be based in part upon interpersonal skills and that, in addition to their present duties, inspectors be assigned on-site monitoring of the direct and contributive responsibility systems at the workplace.

48. That, wherever possible, branch engineers be relieved of workplace inspection and be assigned responsibility for investigation, predevelopment review, consultation, educational activity and response to responsibility system breakdowns.

49. That the future recruitment of branch engineers be based in part upon interpersonal skills and the potential to act in a mediative mode, and that the training and development of branch engineers include these aspects.

COMMENTS

Re: Recommendation 45

Branch inspectors are involved in the development and delivery of all MHSB training programs. A curriculum has been established for inspectors, including training in interpersonal skills, IRS, the regulations, policies and procedures.

A training module on IRS is being designed with labour and industry input.

Re: Recommendation 46

In addition to improving Branch staff capabilities skills, the Ministry has established an Advisory Service to provide additional resources where IRS is faltering due to relationship differences.

Re: Recommendation 47, 48 and 49

Engineers have been relieved of workplace inspections and have been assigned the responsibility for investigation, predevelopment review, consultation, educational activity, and response to responsibility system break-downs as recommended. It is working well. Engineers support the inspectors in investigations. The recruitment of branch engineers and/or inspectors is based on their background knowledge and upon interpersonal skills.

RECOMMENDATION

50. That the tripartite committee responsible for reviewing the mining regulations study all recommendations made by coroners' juries investigating mining fatalities for possible general application and make appropriate recommendations.

COMMENTS

Re: Recommendation 50

The Mining Health & Safety Legislative Review Committee continues to study all recommendations made by each Coroner's Jury. This has been branch practice since 1977.

RECOMMENDATION

GROUND CONTROL AND LIGHTING

51. That wherever practical, fall-on protection be installed on all man-operated equipment.

52. That each mining company operating in Ontario employ at least one professional engineer with post-graduate qualification in rock mechanics and that a person holding such qualification be used in the design and planning of a mine or mine expansion and that a person holding such qualification be used in the design and planning of a mine or mine expansion and that a person holding such qualification be made responsible for the company's ground control program.

53. That a committee of the Mines Accident Prevention Association of Ontario be struck to design a course of study in ground control to be offered through appropriate community colleges of Applied Arts and Technology.

54. That a planned and systematic program of visual inspection of each active work area be conducted in each mine.

55. That the inspections be carried out by persons who have specialized knowledge in rock mechanics.

56. That these inspections be carried out under an auxiliary source of high intensity lighting.

COMMENTS

Re: Recommendations 51 through 61

A Tripartite Committee was formed in 1984 to review the implementation of recommendations in the Burkett report. As a result, and because of a high number of groundfall fatalities that year, it was decided that a focussed inquiry into ground control and emergency preparedness was warranted. This led to the formation of the Provincial Inquiry into Ground Control and Emergency Preparedness in Ontario Mines.

As a result of this inquiry, five new regulations were added under the Occupational Health and Safety Act. Section 5a. requires the preparation of a mine design by a qualified person for each mine, and which must be updated at least annually. Section 10 makes changes in the common core program and includes expanded modules on ground control. Section 62a. requires that a written procedure for communication of ground conditions between workers and supervisors be established at each mine. Section 65a. establishes a minimum cap lamp standard, based on a study conducted by Branch specialists. This section further requires the use of auxiliary lighting where the cap lamp is inadequate. Section 66a. requires fall-on protection for mobile vehicles in certain instances.

These and other initiatives into ground control aspects are more fully explained in the response to the Provincial Inquiry into Ground Control and Emergency Preparedness in Ontario Mines.

RECOMMENDATION	COMMENTS
57. That the person making these inspections be required to file regular written reports with the supervisor of the inspection program.	
58. That work crews be formally and systematically made aware of ground conditions in the areas in which they are working.	
59. That inadequate lighting be investigated as a possible cause of all reportable underground accidents and that in all cases of serious underground accidents, photometric values be recorded by persons trained in the use of photometric equipment.	Re: Recommendation 59 The Branch measures lighting levels in all fatal accidents where lighting may have been a factor.
60. That the Mines Accident Prevention Association of Ontario, in conjunction with the industry, undertake a comprehensive research program to satisfy the needs which have been identified.	Re: Recommendations 60 and 61 This research was carried out under the direction of an expert in mine lighting who was recruited by MAPAO.
61. That an independent authority in the field of mine lighting be retained to direct and co-ordinate the research effort.	

RECOMMENDATION	COMMENTS
WORKER TRAINING	
62. That, upon implementation of the modular training program in specialized skills for underground miners, a modular training program for surface operations be developed.	Re: Recommendation 62 On completion of the full modular training program for underground miners, including the specialty skills, the Ministry of Skills Development Committee directed its attention to "soft rock" mining for the gypsum and salt mines in Southern Ontario and to the supervisor's training program. There is a training program for mill workers nearing completion, one for diamond drilling operations has just been started.
63. That the Mines Accident Prevention Association of Ontario investigate and develop appropriate screening tests for prospective underground miners and make these available to the industry.	Re: Recommendation 63 Both the companies and unions have rejected the recommendation for the development of appropriate screening tests for prospective underground miners. It was considered that this function is better carried out by the mandatory requirement for common core training for new underground miners and by the re-training programs in the various company organizations.
64. That the common core modular training program be augmented by a formal program of on-the-job training leading to full production capability.	Re: Recommendation 64 Each modular training and common core program has been augmented by supervised on-the-job training leading to full production capability. Formal training is also given in the specialty skills including performance demonstrations which must be passed successfully before accreditation is given, leading to ultimate certification as a miner.
65. That each mining company undertake a comprehensive audit of the skills of its underground miners with a view to using modular training to upgrade skill levels.	Re: Recommendation 65 Due to cutbacks over the past few years, the mining companies have had to undertake a comprehensive audit of the skills of their underground miners and to provide the requisite modular training to upgrade these skills. This has come about because of workforce reduction and the need to retrain older workers so that they may be posted into the available jobs.

RECOMMENDATION

ALCOHOL AND DRUGS

66. That the Mines Accident Prevention Association of Ontario obtain the concurrence of the managements of three major mining operations and commission a study to determine the extent of the relationship between alcohol an drug use and accidents at each of these operations.

67. That the results of this study be compared with the results of a survey of the accident report forms submitted to the Workmen's Compensation Board by each of these operations; and that, if the results differ significantly, appropriate changes be made in the manner in which alcohol and drug use is identified and reported as a cause of accidents.

68. That the study include an analysis of the organizational arrangements and the systems of control and communication at each of these operations with a view to determining if these factors contribute to the degree of alcohol or drug use by workers within each operation.

69. That Ontario mining companies and the unions representing workers in the mining industry seriously consider adoption of an approach to the management of alcohol and drug abuse in the workplace along with the lines suggested.

COMMENTS

Re: Recommendations 66 to 69

The MAPAO together with the Addiction Research Foundation established an ad hoc committee from management and unions to investigate the problem of alcohol and drug abuse in the industry. A public seminar was held at Laurentian University in 1985. The larger mining companies have excellent alcohol and drug abuse programs. Most smaller companies have voluntary company/union programs in place, which are working well.

1988 Response of Standing Committee on Resources Development: Recommendation 66

The Standing Committee's response to alcohol and drug use in mining operations is discussed in the Report on Mining Accidents and Fatalities, Recommendations 18.1 – 18.4.

RECOMMENDATION

CONTRACTORS

70. That whenever a contractor is engaged, the company meet with the contractor before commencement of the project to stipulate the safety requirements which must be met if the contractor is to be permitted to commence or continue the project.

71. That the project be rigorously inspected by the company to ensure compliance with these requirements.

72. That a mining company give preference in the awarding of contracts to contractors who have demonstrated satisfactory safety performance; and that the company consider a reward-penalty contract provision related to safety performance on the project.

73. That the Mining Health and Safety Branch be advised by each mining company of all contract projects well in advance of the starting date of such projects.

74. That the Mining Health and Safety Branch increases its regular inspections of these projects and, using its accident profile data, devote special attention to those contractors who demonstrate unsatisfactory safety performance.

COMMENTS

Re: Recommendations 70 through 73

There is general agreement with the recommendations regarding contractors with the exception of Number 72 where the company is expected to consider a reward/penalty contract provision related to safety performance on the project. Companies state this would be extremely difficult to administer. They have taken a pro-active stance by screening the contractors and going over the job procedures. The unions suggest that they could have a positive role in safe work procedures by having the right to inspect the contractor's workplaces. This is a matter for local determination and would depend on whether the contractor had a safety committee unit or not. The company still has the obligation to ensure that the contractor complies with the OHS Act and Regulations.

1988 Response of Standing Committee on Resources Development: Recommendation 72

In view of the excessive number of fatalities among mining contractors, the Standing Committee on Resources Development urges mining companies to follow through on this recommendation concering a reward-penalty provision.

Re: Recommendation 73 and 74

The Mining Health and Safety Branch is advised by the mining companies of all contract projects well in advance of the start-up date and as a result has been able to increase its regular inspections of these projects.

RECOMMENDATION

75. That a system of merit rating for purposes of determining the amount of the Workmen's Compensation assessment for contractors operating in the mining industry be established; and that separate rate groups be established for shaft sinking and mining contractors, general contractors and diamond drilling contractors.

76. That the chief executive officer of each contractor engaged in projects for Ontario mines and mining plants review his personal commitment and contribution to the safety performance of his organization with a view to exercising his authority and leadership.

COMMENTS

Re: Recommendation 75

This matter has to be answered by the WCB.

Re: Recommendation 76

The Chief Executive Officer should periodically review his/her personal commitment to safety and this commitment should be communicated in writing.

1988 Response of Standing Committee on Resources Development: Recommendation 75

The Standing Committee on Resources Development learned from the WCB that the Board is willing to entertain applications for entry into experience rating plans from the rate groups identified by Burkett. However, the Board cautions against creation of rate groups too small to be stable and actuarily viable. Diamond drill contractors and general contractors are already covered by experience rating.

RECOMMENDATION

ACCIDENT DATA BASE

77. That the Ministry of a Labour, in consultation with management, labour, and the Mines Accident Prevention Association of Ontario, determine the specific information required to maintain an occupational accident data base for mines and mining plants which satisfies the prerequisites identified, and provide the Occupational Health and Safety Division of the Ministry with the resources and expertise necessary to collect this information, analyze and disseminate it.

COMMENTS

Re: Recommendation 77

Because of apprehension that the Ministry might wish to use information obtained from the gathering of accident statistics for prosecution purposes, the decision was made for the MAPAO to be the authority for the Accident Data Base. A tripartite committee was set up to design the system. This committee was highly successful in developing a form that is concise and is in use by all companies for their accident reporting system. It is interesting to note that Energy Mines and Resources Canada has adopted the MAPAO system for the collection of injury data for application Canada-wide. Also, British Columbia has modelled its accident data base on the MAPAO system.

RECOMMENDATION

JURISDICTIONAL AND ADMINISTRATIVE ARRANGEMENTS FOR SAFETY OF ONTARIO URANIUM MINERS

78. That the Government of Canada incorporate by reference, the Ontario Act and regulations, as amended from time to time, directly into the Canada Labour Code as a provision covering uranium miners and plant workers, and also provide in the code that, where the other provisions of the code and this provision are in conflict the latter shall apply.

79. That the Government of Canada proceed by way of a reference to the Supreme Court of Canada by the Governor General in Council under section 55 of the Supreme Court Act, R.S.C. 1979 C. S-19 and determine whether the federal jurisdiction is exclusive or concurrent.

80. That the Government of Canada and Ontario continue the arrangement under which the enforcement of statutory health and safety requirements in Ontario uranium mines is assigned to provincial authorities.

COMMENTS

Re: Recommendations 78 through 80

The jurisdictional arrangement for Uranium Mines was finalized by agreement on the 18th of June and by Order in Council on the 1st of July, 1984.

RECOMMENDATION

PRODUCTION BONUS

81. That individual mining companies and their respective unions agree to discontinue individual (or small crew) production incentive plans.

82. That the government make known its intention to legislate an end to direct individual (or small crew) production incentive plans in Ontario mines if these plans are not voluntarily discontinued.

COMMENTS

Re: Recommendations 81 and 82

There is a consensus which flows from the report prepared by Jim Fisher of Peter Moon and Associates, that there does not appear to be any great difference between bonus and non-bonus accidents.

A study by the University of Laval for the Quebec mining industry came to conflicting conclusions. They found that for development mining, safety improved slightly with bonus but that for production mining the converse was true.

In a meeting of the Mining Legislative Review Committee in September 1986, it was resolved that the MLRC does not agree to the elimination of the bonus incentives system.

A recent study on the subject shows that in the larger mines where bulk mining methods are the trend, individual bonus has given way to group bonus. In other words, group bonus is evolving as a result of modern mining technology.

1988 Response of Standing Committee on Resources Development: Recommendation 81

For a full discussion of the Standing Committee's thinking on "Production Bonus" see Standing Committee on Resources Development: Report on Mining Accidents and Fatalities, Recommendation 19.1 - 19.2.

RECOMMENDATIONS OF THE STEVENSON INQUIRY

including:

- comments of the Mining Health and Safety Branch, Ministry of Labour;
- comments of the Standing Committee on Resources Development.

RECOMMENDATIONS OF THE PROVINCIAL INQUIRY INTO GROUND CONTROL AND EMERGENCY PREPAREDNESS IN ONTARIO MINES

RECOMMENDATION	COMMENTS
1. RESEARCH	
1.1 That mining companies be encouraged to continue conducting independent research programs as they see fit.	A research coordinating body, called the Mining Research Directorate, has been established and is presently located at Laurentian University in Sudbury. The MRD is financed through the Ontario Mining Association and is governed by a Board of Directors made up of representatives from industry, labour and government. The MRD has a technical advisory committee, comprised of engineers within the industry, with a goal of identifying needed research. Once an individual project has been approved, the MRD seeks funding from appropriate companies or government agencies and establishes a contract. Other programs have been established to generate geomechanics research in Ontario. A Rockburst Research project, presently in its third year of a five year program, is equally funded by the governments of Canada and Ontario and industry. This program, aimed specifically at a better understanding of the causes of rockbursts and the minimization of their hazard, is expected to cost in excess of $4.2 million. Another program established under a Canada-Ontario Mineral Development Agreement, is directing $3.5 million towards research into backfill in mines and mine design. This project is also in the third year of a five year program.
1.2 That mining companies, with the support of labour and government, shall establish a research organization to act as a central body to coordinate research into ground control and rock mechanics in Ontario mines. This coordinating body shall be managed by a Board of Directors made up of members currently active in the industry an representing all facets of it -- management, labour and government. The Board would appoint an Executive Director who, with an appropriate staff, would manage the research coordination and to be accountable to the Board. The initial program would cover at least the following areas: a) Identify ground control problems in Ontario mines; b) Identify needed research and the appropriate agencies to conduct it; c) Contract for the necessary research to be done, and supervise its quality;	

RECOMMENDATION

Research 2.2 Continued

d) Ensure that the results of the research are published on a regular basis so that mine management, appropriate labour representatives and government agencies are fully informed; and

e) Participate in the development of guidelines for the implementation of safe ground control practices.

3. This organization shall be funded by mining companies operating in Ontario, and by the federal and provincial governments.

4. Among the subjects the organization shall consider for funding are the following:

Rockbursts/Destressing/Backfill (including quality monitoring and backfill testing methods)/Blasting (including vibration damage and drilling controls)/ Ground support (including rockbolting and mechanical supports)/ Monitoring and testing of ground conditions/Mine lighting/Computer modelling/ Equipment design and mechanization as it applies to hazardous ground conditions.

COMMENTS

RECOMMENDATION

2. TRAINING

2.1 That a separate section on ground control be added to the skills included in the Common Core training for new underground miners.

2.2 That the present tripartite committee established to approve modular training programs shall expand those programs to include specialist modules on ground control for all underground miners.

2.3 That all miners receive periodic refresher courses in ground control if required. Labour shall be encouraged to participate in the development of the curriculum.

2.4 That miners who have been off the job for one year or more should be evaluated with respect to their knowledge of current ground control practices, an should receive appropriate training where necessary before they return to regular underground work.

2.5 That non-miners working underground be trained in the fundamentals of ground control, including the recognition of potential hazards.

2.6 That all mining supervisory staff receive adequate training in ground control. The ground control module for supervisors being developed by the tripartite committee on modular training shall be deemed adequate for this purpose.

COMMENTS

The Common Core training for underground miners is required under Section 10 of the regulations under the Occupational Health and Safety Act. This regulation has been revised to expand the requirement for training to all new underground miners.

10. (1) Employers in the following types of mines and mining plants shall establish and maintain the following training programs developed jointly by labour and management in the mining industry and the Ministry of Skills Development and approved by the Director:

1. Hard rock underground mines,

   i. Common Core for Basic Underground Hard Rock Mining Skills (Program #P770010). (Basic Common Core Program),

   ii. Speciality Modules Underground Hard Rock Mining (Program #P770010),

   iii. Common Core for First Line Production Supervisors Underground Hard Rock Mining (Program #P770120).

2. Soft rock underground mines,

   i. Common Core for Basic Underground Soft Rock Mining Skills (Program #P770130). (Basic Common Core Program),

   ii. Speciality Modules Underground Soft Rock Mining (Program #P770130).

RECOMMENDATION

2. Training Continued

2.7 That health and safety committee members shall receive the same training in ground control as supervisory staff.

COMMENTS

10. (2) An employer shall train each full-time worker who commences employment after the 1st day of June, 1987 in the Basic Common Core Program described in subsection (1) appropriate for that worker and the training shall be given within the first year of employment.

10. (3) Subsection (2) does not apply if the worker successfully completed the Basic Common Core Program appropriate for that worker prior to being employed by the employer or was accredited under the predecessor of this section and gives the employer proof thereof.

10. (4) A certificate issued by the Ministry of Skills Development showing that a worker has successfully completed a training program referred to in subsection (1) is conclusive proof for the purposes of this section of the worker's successful completion of the program.

The curriculum of the Common Core program is established through the Tripartite Committee on Training which has representation by industry, labour and government, through the Ministry of Skills Development. This committee is establishing enhanced ground control modules with this program. A modular training program for supervisors has also been established with a separate module on ground control.

The Mining Health and Safety Branch has developed a number of training modules, including three ground control modules, which are available through the Mines Accident Prevention Association of Ontario.

The Ministry of Labour has sponsored, through a $400,000 grant, the establishment of a Training Centre in Ground Control at Cambrian College in Sudbury. This centre will establish training programs for all workers and supervisors, including health and safety committee members, for delivery throughout the province.

RECOMMENDATION	COMMENTS
3. POST SECONDARY EDUCATION	
3.1 That colleges and universities training mining engineers recognize that good undergraduate teaching in a subject such as rock mechanics demands lecturers who have a deep understanding of the subject, solid practical experience in its application in real mining situations, and the ability to present their material in clear and simple terms which will enable the students to apply their knowledge to the solution of the problems they will encounter in the industry.	
3.2 That the teaching staff in colleges and universities with rock mechanics programs shall have strong practical experience in underground hard rock mining.	
3.3 That qualified personnel from the mining industry participate in teaching graduate and undergraduate programs at colleges and universities with rock mechanics programs.	The ground control engineering specialists of the MHSB routinely provide lectures at colleges and universities within the province.
3.4 That additional funding be made available to colleges and universities to provide the improved facilities and instruction necessary to permit adequate training in ground control.	The government of Ontario has established a chair in geomechanics research at Laurentian University and a second at Queen's University is being established. The mining industry, through Placer-Dome, has also established a special chair at the University of Toronto.
3.5 That the mining industry shall establish a special chair in ground control at an Ontario university to improve the standard of teaching in rock mechanics for graduate and undergraduate students, and to conduct research projects directly related to the mining industry. This chair shall be closely identified with the Ontario mining industry.	

RECOMMENDATION

3. Post Secondary Education Continued

3.6 That instruction in ground control be integrated into the undergraduate programs in mining engineering. The Rock Mechanics and Strata Control Committee of the Canadian Institute of Mining and Metallurgy shall be asked to effect this change through the organization of a National Forum on mining-related ground control education.

3.7 That community colleges and universities offering mining programs be encouraged to develop additional short courses in ground control, targeted to specific groups in the mining industry.

3.8 That the mining industry in Ontario be encouraged to sponsor their employees' attendance at existing short courses and other programs as they become available.

3.9 That these short courses be designed so that adequate training can be given in various locations, including remote regions of the province.

3.10 That certification courses be developed in practical ground control for practicing ground control engineers and other technical personnel.

3.11 That the mining industry be encouraged to sponsor qualified employees who seek post-graduate degrees in rock mechanics.

COMMENTS

A National Forum on mining education is planned for May 1988 in Edmonton, under the auspices of the Canadian Institute of Mining and Metallurgy.

The government of Ontario has undertaken a study of post-secondary programs in mining. This report, undertaken by C.B. Ross, was tabled with the Ministry of Labour in April 1987.

1988 Response of Standing Committee on Resources Development: Recommendation 3.6

The Standing Committee on Resources Development learned that the National Forum on mining-related ground control education has been postponed. It will be rescheduled following the appointment of a professional engineer to the Chair of Geomechanics Research at Queen's University. The Committee urges that the National Forum be held soon after the appointment.

RECOMMENDATION	COMMENTS
4. COMMUNICATIONS	
4.1 That companies reassess the effectiveness of their methods of providing information on ground control and emergency preparedness to employees.	A new regulation, section 62a. has been included in the Regulations for Mines and Mining Plants which requires each mine to establish a communication procedure regarding ground conditions between workers and supervisors.
4.2 That mining companies recognize that it is the responsibility of management to establish direct and effective communication between management and workers, and to ensure that adequate mechanisms exist for clear and timely feedback from workers to management.	62a. (1) An employer in an underground mine, in consultation with the joint health and safety committee, if any, for the mine, shall develop a written program to provide for the timely communication of information between workers and supervisors in the mine respecting ground stability, ground movement, falls of ground, ground monitoring equipment and emergencies.
4.3 That management should also ensure that mechanisms are in place to provide effective communication between workers on cross-shifts, and that these means of communication be available to both workers and supervisors.	(2) The communications program shall set out, (a) means and procedures for communicating information; (b) the kind of information to be communicated; and (c) the actions to be taken by supervisors and workers with respect to information that is communicated to them.
4.4 That research to perfect the development of an effective radio communication device for use underground be continued and accelerated, with active government support.	The MHSB has sponsored a seminar on radio communication devices with widespread industry attendance. The Branch will continue to support development of a practical system and encourage its use in all mines.
4.5 That once developed an available, these devices be installed in underground locations as necessary.	

RECOMMENDATION

5. MINE DESIGN AND PLANNING

5.1 That mine design continue to be recognized as the sole responsibility of management, and that management accept the need to use appropriate technology in designing mines.

5.2 That mine design and subsequent implementation be under the direction of a technically competent person.

5.3 That every underground mine be required to prepare a ground control micro-environment design prior to the introduction of a new mining method, or the introduction of any expansion of the present mine design; such designs shall be submitted to the Ministry of Labour as required by section 5 of the mining regulations.

5.4 That technically competent personnel of the Ministry of Labour review ground control design and procedures at all Ontario mines, at the mine site, at least once per year, and more frequently as required.

5.5 That the principles and details underlying the mine designs referred to in Recommendation #3 be communicated directly to persons concerned at all levels of the operation, including the appropriate officials of the union representing the mine crews; and that this communication take place before and during the implementation of the design.

COMMENTS

A new regulation, Section 5a. has been established. It requires each mine to prepare a mine design that addresses all aspects of ground control at least annually.

5a. (1) The owner of a surface mine producing metallic ore or of an underground mine shall prepare and maintain a mine design assessing the ground stability of the active and proposed workings of the mine.

(2) The mine design shall consist of drawings, plans or specifications and shall,

(a) describe the geology of the mine;

(b) outline the geometry of existing and proposed excavations;

(c) describe previous occurrences of ground instability;

(d) describe the mining method including stope sequencing and blasting methods;

(e) specify the ground support system; and

(f) describe measures planned and used to assess potential ground instability such as instrumentation and computer modelling.

(3) The mine design shall be assessed and updated at least annually and also before any alteration is made to the mine that may significantly affect the ground stability of the mine.

RECOMMENDATION	COMMENTS
5. Mine Design and Planning Continued	
5.6 That the Ministry of Labour review and monitor the regional stability affecting underground mines in Ontario, and discuss potential problems with the mining companies involved.	5a. (4) The mine design shall be available at the mine site for review by an engineer of the Ministry and by the joint health and safety committee, if any, for the mine.
5.7 That mining companies sharing a common boundary exchange information that may affect the regional stability of either or both.	(5) Where an engineer of the Ministry so requires in writing, an owner of a mine to whom this section applies shall provide, at the owner's expense, a report by a professional engineer stating that the mine design for the mine conforms to good engineering practice.
	The MHSB has implemented a program to audit the mine design required under section 5a. and the communications procedure required under section 62a. Two additional ground control engineers have been hired for this program.
	Section 5a. requires that the mine design be shared with the worker's representatives.
	Regional stability will be addressed as part of the mine design audits.
5.8 That workplace mining plans be made available to miners and be discussed with them, including any indications of abnormal ground conditions, geological anomalies, and the location of ground monitoring instruments, as a method of ensuring worker participation in planning ground control procedures in the "micro" environment.	The implementation of regulations 5a. and 62a. address the identification and communication of abnormal ground conditions between management and worker.

RECOMMENDATION	COMMENTS
6. EMERGENCY PREPAREDNESS	
6.1 That the current mine rescue organization be expanded to handle all underground emergencies.	There has been an expanded role of the mine rescue organization in non-fire emergencies. The principal focus of this expansion was towards evaluating and acquiring equipment which would assist in rescuing miners. The workload resulting from this expansion of equipment and training, required a workload study which resulted in one additional mine rescue officer being recruited.
6.2 That the necessary additional training in non-fire emergencies be developed by a tripartite committee consisting of representatives of mine management, unions and government.	The nature of the training required for non-fire emergencies has required considerable study. A tripartite committee was established to assist in determining these training needs. The tripartite committee referred to above has reviewed and advised on the long-term role of mine rescue including mine rescue equipment.
6.3 That a tripartite committee also be established to advise on all aspects of mine rescue equipment and emergency warning systems.	
6.4 That mine rescue personnel suffer no loss of income as a result of injuries arising from mine rescue activities.	Current WCB legislation provides for 90% of a miner's regular wages. In addition some employers do ensure that injured employees suffer no loss of wages.
6.5 That the Ministry of Labour Mine Rescue organization be responsible for identifying and introducing specialized equipment needed for use in non-fire emergencies, an for developing or finding sources for such equipment.	The mine rescue organization has continuously evaluated new products for fire, and more recently, non-fire emergencies. This is an ongoing program to ensure the best technology is being used. Some non-fire emergency equipment is being sourced and evaluated by other specialists within the MHSB such as the working environment and the ground control staff. The sources and equipment evaluations of any specialized equipment will be put onto a computerized data base to enable quick retrieval. Some of the non-fire equipment has already proved its worth during recent emergencies.

RECOMMENDATION	COMMENTS
6. Emergency Preparedness Continued	
6.6 That manway sizes, escape routes and refuge stations be sufficient to accommodate rescue operations.	Guidelines and regulations are in place for manway sizes, escape routes and refuge station locations.
6.7 That the Workers' Compensation Board re-evaluate the qualifications required for mine first-aid attendants.	
6.8 That all underground workers be encouraged to take first-aid training and to keep their training current.	The supervisor's training program, now includes first-aid training. Most mines encourage workers to take first-aid training.
6.9 That the Ministry of Labour, with the assistance of the Mining Legislative Review Committee, draft comprehensive first-aid regulations with specific reference to underground mining operations.	First-aid regulations have been drafted and will be tabled for discussion at the MLRC meeting in February 1988.

1988 Response of Standing Committee on Resources Development: Recommendation 6.7

The Standing Committee on Resources Development learned that the Occupational Health and Safety Education Authority (OHSEA) has initiated a comprehensive review of Regulation 950 under the Workers' Compensation Act which deals with the qualifications for mine first aid attendants. There is talk of creating a separate first aid regulation for underground mines which would be included in the regulations for mines and mining plants.

RECOMMENDATION

7. MINE LIGHTING

7.1 That auxiliary high-intensity lighting be available in all active work areas to assist in ground-control-related activities such as inspection and scaling.

7.2 That within one year of the release of this report lighting standards -- as they relate to ground control and emergency preparedness-shall be established for use in all underground mines.

COMMENTS

The MHSB has conducted a study into the effectiveness of miner's cap lamps in relation to ground control procedures. As a result a minimum standard has been established. Regulation 65a. has been added to regulate this standard. This regulation further requires the use of auxiliary lighting where necessary.

65a. (1) Illumination shall be provided in an underground mine adequate for a worker to visually assess ground conditions at the worker's work place.

(2) Where a cap lamp is used to provide the illumination as required by subsection (1), it shall be capable of providing a peak illuminance of at least 1500 lux at 1.2 metres from the light source.

(3) An employer in an underground mine who supplies cap lamps to workers shall develop a procedure for assessing and maintaining cap lamps and a copy of the procedure shall be available a the mine site for review by an engineer of the Ministry and by the joint health and safety committee, if any, for the mine.

(4) A record of cap lamp maintenance test results shall be kept.

(5) Notwithstanding subsection (2), if the ground to be assessed is at a distance that is greater than the effective range of a cap lamp, the employer shall supply, and the worker shall use, auxiliary lighting that will provide the illumination required by subsection (1).

(6) This section comes into force on the 1st day of June, 1988.

RECOMMENDATION	COMMENTS
8. MONITORING AND INSTRUMENTATION	
8.1 That research into improved rock mechanics instrumentation of all types be undertaken.	The Mining Research Directorate is presently reviewing needed research and development of improved monitoring devices.
8.2 That specific research to develop improved, reasonable-cost measuring devices be pursued.	
8.3 That guidelines be developed for the interpretation of data produced by ground monitoring devices.	The Mines Accident Prevention Association of Ontario is developing a series of brochures to explain the various types of instrumentation used and to provide guidance to their use and interpreting results.
8.4 That all information obtained from ground monitoring devices at a particular mine be provided to the union representing workers in that mine.	Regulations 5a. and 62a. adequately address the collection and communication of information related to the evaluation of ground control monitoring devices.
8.5 That any evaluations of ground conditions in areas being mined shall be given to the union representing workers in each mine, and shall also be communicated directly to the workers involved.	
8.6 That mines experiencing on-going rockbursting problems install instruments, such as micro-seismic monitoring devices, to monitor seismicity in the affected areas.	Regulation 66 provides the authority for an engineer of the Ministry to require the installation of monitoring devices should the company be unwilling to do so.

RECOMMENDATION	COMMENTS
9. MISCELLANEOUS	
Soft Rock	
9.1 That soft rock mining operations be considered separately from hardrock mining in setting standards related to ground control practices.	The revised section 10 of the regulations recognizes a separate training program for soft rock mines.
Ministry of Labour	
9.2 That the Ministry of Labour, through training and recruitment, ensure that its ground control staff be at a world-class level in their discipline, and have the credibility to relate effectively to the international ground control community.	The MHSB has recently doubled its complement to four with the recruitment of two mining engineers with post-graduate degrees in rock mechanics. The ground control staff maintain an active participation in international and national bodies like the Rock Mechanics and Strata Control Committee. The Branch is involved in a cooperative agreement with the Canadian and US governments to exchange information on ground control and related research.
9.3 That the Ministry of Labour establish a Technical Support Centre with the following functions:	The government of Ontario has announced the establishment of a Technical Support Centre at Sudbury which is related to the relocation of the MHSB staff from Toronto. The Centre, to be established adjacent to Laurentian University, will provide expanded facilities.
a) to support an expanded role in predevelopment review and annual mine design review as recommended elsewhere in this report;	
b) to establish facilities for training in ground control (although this should not conflict with existing established training programs).	The ground control department has already begun to acquire an array of equipment available for emergency responses or special investigations.
c) to develop, and provide to mines on short-term loan, ground control instruments and testing equipment;	

RECOMMENDATION	COMMENTS
9. Miscellaneous Continued	
9.3 d) to establish and maintain a computerized data base containing operational information on ground control and emergency preparedness and provide access to it to the mining industry, and to the research coordinating body recommended elsewhere in this report;	Databases of falls of ground and rockbursts within the province have been established in order to better identify hazards or trends.
e) to develop and maintain a library of computer software related to ground control technology, and especially to the interpretation of data from ground control monitoring devices.	MHSB engineers in conjunction with the U.S. Bureau of Mines and the Federal Department of Energy Mines & Resources are presently compiling a database of ground control related software as part of its cooperative agreement on ground control. Branch engineers are also involved with a subcommittee of the Canadian Institute of Mining to develop an expanded database in this regard.
f) The specialist ground control engineers employed in the Technical Support Centre should not be involved in the regulatory functions of the Ministry.	The primary role of the MHSB ground control engineers is to provide technical support, through advice and training, to the inspectors. Enforcement of the regulations is the responsibility of the inspectorate.
g) The Technical Support Centre shall not be in conflict with the research coordinating body recommended elsewhere in this report.	Branch staff maintain active contact with the Mining Research Directorate with the intent that research be coordinated through that agency.
9.4 That Ministry of Labour inspectors be provided with such additional training as may be required to enable them to deal effectively with site-specific ground control problems.	The MHSB has developed an extensive training program for its inspectors which includes a significant ground control component.
9.5 That these inspectors enforce ground control regulations more vigorously.	The ground control audit program established by the Branch is intended to focus subsequent inspections with respect to ground control regulations.

RECOMMENDATION

9. Miscellaneous Continued

Fall-On Protection Systems

9.6 That Fall-on Protection shall be mandatory on all vehicles operating in areas requiring this type of protection. The recommendation shall be referred to the established FOPS sub-committee which will develop standards for its implementation.

1988 Response of Standing Committee on Resources Development: Recommendation 9.6

The Standing Committee on Resources Development concurs with this recommendation concerning "fall on protection" but believes that the current regulation 66a Ontario Reg. 258/87 needs to be strengthened. See Report on Mining Accidents and Fatalities, Recommendation 11.4.

COMMENTS

A new regulation section 66a. has been added which required fall on protection for mobile vehicles in certain situations.

66a. (1) Devices to protect operators from falling objects shal be installed on every motorized trackless vehicle used,

(2) Devices required by subsection (1) shall consist o overhead protective devices built to withstand a minimu of 11.5 kilojoules of energy when tested in accordanc with the Society of Automotive Engineers' Standard SA J231 "Minimum Performance Criteria for Falling Objec Protective Structures (FOPS)" and the devices shall b maintained in good condition.

(a) in a new underground mine that is developed afte the 1st day of June, 1988; or

(b) in an area in an underground mine with respect t which an engineer of the Ministry has given th owner a written opinion that local ground stabilit presents a hazard to the operators.

(3) Clause (1)(a) does not apply to a motorized trackles vehicle while it is being used in an area in a underground mine that is made safe by scaling, timberin or rockbolting or by measures that provide safety equa to or better than scaling, timbering or rockbolting.

(4) This Regulation comes into force on the 1st day of June, 1987.

RECOMMENDATION

9. Miscellaneous Continued

Worker Inspectors

9.7 That worker-inspectors, where they exist, be given the same training in ground control as that recommended for supervisory staff elsewhere in this report.

This Committee

9.8 That this committee will remain seized with this study and will reconvene as necessary to discuss matters requiring further attention and to monitor progress on the implementation of these recommendations.

APPENDIX B

LIST OF WITNESSES

From the Ministry of Mines

W. Dennis Tieman, Assistant Deputy Minister, Mines and Minerals Division
Gerhard Anders, Senior Policy Advisor and Manager, Mineral Analysis and Statistics, Mineral Development and Lands Branch

From the Ministry of Labour

Tim Millard, Assistant Deputy Minister, Occupational Health and Safety Division
Victor Pakalnis, Director, Mining Health and Safety Branch
Arthur Gladstone, Executive Director, Occupational Health and Safety
J.J. Lazurko, Chief Electrical/Mechanical Engineer, Mining Health and Safety Branch (Sudbury)
Allin Brady, Working Environment Inspector
Ken Pierce, Mine Rescue Training Officer, Mining Health and Safety Branch (Elliot Lake)
Tom Burrows, Russ Conley, Doug Skogstad, Gerry Giasson, Ralph Regan, Mining Inspectorate, Mining Health and Safety Branch

From the University of Toronto

Dr. Evert Hoek, N.S.E.R.C. International Research Professor of Rock Engineering, Department of Civil Engineering

From the Workers' Compensation Board

Ron Stephens, Executive Co-ordinator, Statistical Services Branch
Peter Lewycky, Manager, Statistical Analysis, Statistical Services Branch
John Ridout, Administrator, Management Group, Occupational Health and Safety Education Authority
Stewart Cooke, Administrator, Labour Group, Occupational Health and Safety Education Authority

From the Mines Accident Prevention Association Ontario

Bob Brailey, President
Bill Coughlan, Executive Director

From the Tripartite Mining Fatalities Committee

Bob Brailey, Chairman
Bill Coughlan, Secretary
Rick Briggs, Mine, Mill and Smelter Workers' Union
Henry Brehaut, Senior Vice-President, Placer Dome Inc.
Victor Pakalnis, Director, Mining Health and Safety Branch, Ministry of Labour

Ron Smith, consultant on mining issues, and former Executive Director of the Joint Federal-Provincial Inquiry Commission into Safety in Mines and Mining Plants in Ontario (Burkett Commission)

From the Ontario Mining Association

John Gordon, Chairman
Patrick Reid, President
Bruce Campbell, Manager, Technical Services

From Queen's University

Dr. Peter Calder, Head, Department of Mining Engineering

From the Canada Gypsum Company

Laurie Wright, Manager, Hagersville Plant
Stephen Faller, Mine Manager, Hagersville Mine
T.T. Schoffer, Geologist

From Domtar Chemicals Group, Sifto Salt Division

E.F. Whitlock, Manager of Manufacturing
Gaston Brosseau, Mine Manager, Goderich Mine
Al Hamilton, Geologist

From the Energy and Chemical Workers' Union

Terry McGuire, President, Local 16
Harvey Cheron, Vice-President, Local 16

From the Canada Centre for Mineral and Energy Technology

David Hedley, Executive Director
Michel Grenier
Tom Semadeni

From Denison Mines Ltd., Elliot Lake Operations

Colin Benner, Vice-President, Uranium Operations
Fergus Kerr, General Mine Manager
Peter Townsend, Manager, Engineering
Chuck Chakravatti, Senior Environmental Engineer

From Rio Algom Ltd., Elliot Lake Operations

Donald Cumming, Vice-President and General Manager
Guy Napier, Area Safety and Loss Control Superintendent

From the United Steelworkers of America

Norm Carriere, Director, Occupational Health and Safety, District 6
Homer Seguin, Northeastern Ontario Regional Representative
Albert Kanabe, Chairman, Health, Safety and Environment Committee, Local 5417
Keith Salmon, Compensation Officer, Local 5417
Andre Allard, Chairman, Environment, Safety and Health Committee, Local 5762
Dave Campbell, President, Local 6500
Doug Earl, Vice-President, Local 6500
Don McGraw, Chairman, Safety, Health and Environment Committee, Local 6500
Pat Casey, Co-Chairman, Health and Safety Committee, Local 14994
Steve Smith, Health and Safety Representative, Local 14994
George Mondoux, Safety and Health Committee, Local 5980
Moe Sheppard, Representative, Local 7580
Roger Latisseur, Representative, Local 4440
Ken Linklater, Occupational Hrealth and Safety Committee, Local 4440
John Perkwood, Staff Representative
Gordie Prest, Representative, Local 950

From Inco Limited, Ontario Division

Paul Parker, Vice-President, Administration, Engineering Maintenance
Graham Ross, Director, Safety and Environment
Albert Magee, Director of Human Resources and Administration

From the Mine, Mill and Smelter Workers' Union

Rick Briggs, President, Local 598
Gary Herstack, Compensation Officer
Vince Hickey
Rene Henri

From Falconbridge Limited, Sudbury Operations

George Reed, Vice-President and General Manager
Larry Watkinson, Superintendent of Safety and Plant Protection
Lyle McKague, Smelter Superintendent
Stan Bharti, Superintendent of Mines Technical Services
Don Mills, Superintendent, Personnel and Labour Relations
Albert Cecutti, Medical Director

From Cambrian College

Dennis Shannon, Executive Co-ordinator, Ontario Centre for Ground Control Training
Dan Millette, Ground Control Technician, Ontario Centre for Ground Control Training
Gib Gilchrist, Labour Studies Program

From Domtar Construction Materials, Caledonia Plant

Don Moses, Works Superintndent
Don Dickie, Mine Superintendent
John Harper, Health and Safety Supervisor
Hugh Secord, Personnel Superintendent
Vic Bachmeier, Safety Co-ordinator

From the Canadian Salt Company Limited

Paul Blair, Manager, Ojibway Mine
Bob Geigerich, Mine Superintendent
Howard Marjerrison, Safety Superintendent

From the Canadian Diamond Drilling Association

Max Matte, Manager

From Placer Dome Inc.

Bob Perry, General Manager, Dome Mine, Timmins
Stew Reid, Mine Manager, Campbell Red Lake Mine

From the Porcupine Mine Managers' Group

Mike Amsden

From Dickenson Mines Limited

Bruce Bried, Mine Manager, Arthur W. White Mine

From the Canadian Auto Workers Union

Jim Gill, Director of Health and Safety
Rick Laramie, Action Union Chairman, Local 195

From Hemlo Gold Mines Inc.

Walter Segsworth, Manager, Golden Giant Mine

From Noranda Minerals Inc., Geco Division

Frank Grebenc, Mine Manager, Geco Mine
Robert Girard, Safety Director

From the Canadian Union of Base Metal Workers (CNS)

Ian MacQuarrie, Representative

From the Mining Legislative Review Committee

Paul Hess, Chairman

APPENDIX C

LIST OF MINE AND PLANT TOURS

Monday, February 15, 1988

Canada Gypsum Company Limited
Hagersville Mine

Tuesday, February 16, 1988

Domtar Chemicals Group, Sifto Salt Division
Goderich Mine

Thursday, February 18, 1988

Denison Mines Limited, Elliot Lake Operations
Elliot Lake Shaft #2

Tuesday, February 23, 1988

INCO Limited, Ontario Division
Cooper Cliff
Stobie Mine

Wednesday, February 24, 1988

Falconbridge Limited, Sudbury Operations
Falconbridge
Falconbridge Smelter

Monday, March 7, 1988

Domtar Construction Materials
Caledonia Mine

Wednesday, March 9, 1988

Canadian Salt Company Limited
Windsor
Ojibway Mine

Monday, March 21, 1988

Placer Dome Inc.
Timmins
Dome Mine

Tuesday, March 22, 1988

Placer Dome Inc.
Balmertown
Campbell Red Lake Mine

Wednesday, March 23, 1988

Hemlo Gold Mines Inc.
Marathon
Golden Giant Mine

Thursday, March 24, 1988

Noranda Minerals Inc., Geco Division
Manitouwadge
Geco Mine and Mill

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